No. 17-1104

IN THE

Supreme Court of the United States

AIR AND LIQUID SYSTEMS CORP., *et al.*,

Petitioners,

v.

ROBERTA G. DEVRIES, INDIVIDUALLY AND AS ADMINISTRATRIX OF THE ESTATE OF JOHN B. DEVRIES, DECEASED, *et al.*,

Respondents.

INGERSOLL RAND COMPANY ,

Petitioner,

v.

SHIRLEY MCAFEE, EXECUTRIX OF THE ESTATE OF KENNETH MCMEE, AND WIDOW IN HER OWN RIGHT,

Respondent.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT

BRIEF FOR RESPONDENTS

DENYSE F. CLANCY
KAZAN, MCCLAIN, SATTERLEY & GREENWOOD
55 Harrison Street, Suite 400
Oakland, CA 94607
(877) 995-6372
dclancy@kazanlaw.com

RICHARD P. MYERS
Counsel of Record
ROBERT E. PAUL
ALAN I. REICH
PATRICK J. MYERS
PAUL, REICH & MYERS, P.C.
1608 Walnut Street, Suite 500
Philadelphia, PA 19103
(215) 735-9200
rmyers@prmpclaw.com

Counsel for Respondents
(Additional Counsel Listed on Inside Cover)

2817732

JONATHAN RUCKDESCHEL
THE RUCKDESCHEL LAW FIRM, LLC
8357 Main Street
Ellicott City, MD 21043
(410) 750-7825
ruck@rucklawfirm.com

WILLIAM W.C. HARTY
PATTEN, WORNOM, HATTEN & DIAMONSTEIN
12350 Jefferson Avenue, Suite 300
Newport News, VA 23602
(757) 223-4500
wharty@pwhd.com

Counsel for Respondents

QUESTION PRESENTED

Under general maritime negligence law, does a manufacturer have a duty to warn users of the known hazards arising from the expected and intended use of its own product?

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INTRODUCTION

We learn in our first year of law school that a manufacturer must warn end-users if its product is hazardous when used as intended. *See, e.g.*, Restatement (Second) of Torts § 388 (1965). This principle has been incorporated in general maritime negligence law and the prevailing law on land for over one hundred years.

Petitioners designed, manufactured, and sold machines that required asbestos parts to function. Petitioners' machines were not "bare metal;" they incorporated asbestos parts and could not work without them.

As part of the bargained-for sale, petitioners supplied maintenance manuals for their machines. Petitioners' manuals instructed users to replace the original asbestos parts with identical replacements, but did not warn users to avoid breathing asbestos dust. Because replacing asbestos parts created dust, exposure to asbestos was inevitable if the user followed the instructions in petitioners' manuals. Indeed, petitioners purchased insurance against future liability for asbestos diseases.

Applying hornbook negligence law and maritime law's "duty of reasonable care under the circumstances of each case," *Kermarec v. Compagnie Generale Transatlantique*, 358 U.S. 625, 632 (1959), petitioners had a duty to warn users of the known hazards arising from the expected and intended use of their products. This is all the more so when, as here, petitioners' maintenance manuals directed the user on when and how to perform the work that created the dust.

To avoid liability, petitioners propose a unique exception that abolishes their duty to warn about the foreseeable hazards arising from use of their machines. Petitioners' rule would apply to all maritime workers: civilian or Navy, fishing vessel or self-employed crabber, recreational boater or floating offshore drilling platform. Petitioners base their exception on four primary arguments. First, petitioners attempt to change the products at issue from their integrated machines to the replaceable asbestos parts necessary for their machines to work. Second, petitioners claim that foreseeability has no place in maritime negligence law. Third, petitioners proclaim that maritime work is now "safe." Fourth, petitioners ask the Court to adjudicate petitioners' government contractor defense, which neither the district court nor the Third Circuit reached. None of these arguments withstands scrutiny.

Petitioners' Argument One: Petitioners' machines are not the "real" products: Petitioners concede they had a duty to warn the first users of their machines of the danger posed by the original asbestos parts they supplied with their machines. However, petitioners claim that they have no duty to warn after the original asbestos parts were replaced, per petitioners' instructions, with identical asbestos parts.

Why? Because, according to petitioners, the "real" products are not their machines, but *only* the required, replaceable asbestos parts. Thus, petitioners contend, once the original asbestos parts are replaced with identical asbestos parts, petitioners' duty to warn disappears. Petitioners' narrow definition of "the product" has no place in this *negligence* claim, which applies to

petitioners' *conduct. Cf. Lindsay v. McDonnell Douglas Aircraft Corp.*, 460 F.2d 631, 639 (8th Cir. 1972) (noting that maritime strict liability focuses on the nature of the product while negligence focuses on the conduct of the manufacturer).

Under this Court's maritime precedent, the "real" product is petitioners' entire integrated product sold to its customer: the working machinery with its asbestos parts, spare asbestos parts, and the accompanying maintenance manual. *See E. River S.S. Corp. v. Transamerica DeLaval, Inc.*, 476 U.S. 858, 867 (1986) ("Since each turbine was supplied by DeLaval as an integrated package . . . . each is properly regarded as a single unit."). Petitioners had a duty under general maritime negligence law to warn of the hazards inevitably arising from the expected and intended use of their machines, including during their maintenance and repair.

Petitioners' Argument Two: Abolish foreseeability: Petitioners ask this Court to overturn a century of general maritime and traditional tort law and establish a new rule that abolishes as "unworkably vague" the application of foreseeability in negligence cases. Pet.Br. 19. Contrary to petitioners' contention, foreseeability is an important *limiting* factor in tort litigation. Manufacturers must warn product users of the dangers they know users will face when using the products as expected and intended, but they need not warn of unforeseeable dangers. This is a simple and uniform rule.

Petitioners' proposed rule disrupts uniformity. Established maritime precedent has consistently conducted a fact-based analysis when applying basic

concepts such as foreseeability or, as in this case, inevitability. If foreseeability is eliminated in this case, maritime law will no longer be uniform. For example, maritime law applies a foreseeability test to determine if an event was a superseding cause. *See Exxon Co. v. Sofec*, 517 U.S. 830, 837 (1996). Petitioners' proposed rule would mean that foreseeability applies in some instances, but not others.

Petitioners' Argument Three: The seas are now allegedly "safe": General maritime law has not, as petitioners claim, foregone the concept that sailors deserve "special solicitude." Pet.Br. 37-39. Petitioners' assertion that this is an "outdated" concept is unsupported by reality and the law. The recent collisions of the *USS Fitzgerald* and *USS John S. McCain* with commercial ships; the sinking of the *SS El Faro*; the explosion on *Deepwater Horizon;* and fourteen seasons of "Deadliest Catch" demonstrate that the life of a maritime worker remains precarious. Indeed, commercial fishing remains one of the most dangerous occupations in the United States.

Moreover, the Third Circuit's holding accords with the prevailing law on land. Petitioners' rule of blanket immunity would perversely provide sailors ***less*** recourse than land-based workers.

Petitioners' Argument Four: Blame the Navy: Petitioners spend nearly half of their brief arguing that they were innocent "bare metal" suppliers, and it was the Navy that later determined asbestos would be required for their machines to work. If this were true, petitioners would not need to seek a new rule from this Court.

Specifically, the Third Circuit held that there is no duty *unless* petitioners knew (1) of the hazards of their asbestos, and (2) that their products "will be used with an asbestos-containing part" because of active conduct on the part of the manufacturer. This includes (a) "equip[ping]" the product with an asbestos part, (b) "direct[ing]" that the product be used with an asbestos part, or (c) "requir[ing]" that their product use an asbestos part to function properly. Pet.App. 15a-16a. If petitioners' one-sided presentation of the record is to be believed, petitioners would not be liable under the Third Circuit's rule.

Regardless, petitioners' arguments that they were helpless before the Navy's alleged omnipotence have no place here. First, the question presented does not involve the *Boyle* government contractor defense. *See Boyle v. United Techs. Corp.*, 487 U.S. 500 (1988). Neither the trial court nor the Third Circuit ruled on this defense and petitioners are free to pursue it on remand. Second, it is presumed for purposes of this review that petitioners knew of the hazards of asbestos and that their machines will be used with an asbestos-containing part, because petitioners protest the application of the Third Circuit's rule under any circumstances.

Third, respondents proffered contrary evidence that the manufacturers specified asbestos parts for their machinery; supplied their machinery with asbestos; and provided maintenance manuals requiring replacement of asbestos parts with identical asbestos parts. The Third Circuit remanded resolution of these factual disputes to the trial court. Fourth and finally, because petitioners' proposed rule would apply in all maritime cases, including non-Navy cases, their arguments as to the Navy's conduct

should have no bearing on this Court's determination of the proper rule.

In sum, petitioners ask this Court to abandon a century of settled law, jettison as "unworkable" the basic tort concept of "foreseeability," and adopt a new rule of blanket immunity for manufacturers of machines that are inherently dangerous in their normal and intended use. In contrast, respondents ask this Court to reject petitioners' blanket immunity rule in favor of established general maritime and common law rules that promote maritime law's principles of uniformity, simplicity, and solicitude to the sailor. The Third Circuit soundly reasoned that for maritime claims arising in negligence, manufacturers have a duty to warn users of the known hazards arising from the expected and intended use of their products. This Court should affirm.

COUNTER STATEMENT OF THE CASE

This case arises from an order granting summary judgment. Viewing the evidence and inferences therefrom in the light most favorable to respondents (*Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986)), the facts are as follows:

A. Respondents were exposed to asbestos during the expected and intended use of petitioners' machines.

1. Petitioners supplied machines that required asbestos parts to function.

John DeVries ("Mr. DeVries") served in the United States Navy as an engineering officer aboard *U.S.S. Turner* from 1957-60. Resp.App.F 42a-43a. He supervised

the crew in the fire and engine rooms. JA 314, 327-328. The fire rooms contained boilers (with economizers), pumps, and blowers that generated high pressure steam. The engine rooms contained the ship's steam condensers and propulsion turbines that converted the superheated steam into mechanical energy. Resp.App.F 41a; Resp. App.B 11a-13a.

Petitioner Air & Liquid Systems (successor to Buffalo Pumps) and co-defendants IMO (DeLaval) and Warren Pumps manufactured pumps. JA 283-286. Petitioner CBS' predecessors-in-interest (Westinghouse and Sturtevant) manufactured generators, eight forced draft blowers for the boilers, circulating pump turbines and air compressor turbines. JA 420-426. Respondent General Electric (GE) manufactured the main propulsion turbines. CA3-JA 1281-1283.[1] Petitioner Foster Wheeler manufactured economizers for the boilers and condensers.

In high-temperature, high-pressure environments, "industry" standards specified that asbestos must be used with the machinery to prevent leaking, heat contact, and heat dissipation. JA 303; Resp.App.B 11a. Petitioners' engineers, "not just Navy people, at that time said you would use asbestos for high-temperature applications." JA 322. The type of insulation used "depended on the pump suppliers' specs." Resp.App.G 158a. Thus, Buffalo directed that its pumps be used with asbestos-containing packing. CA3-JA 357-408. Warren supplied its pumps with asbestos packing and further required external asbestos insulation. CA3-JA 1515-1518. GE and Westinghouse required their

1. Citations to "CA3-JA" refer to the Joint Appendix filed in the Third Circuit.

turbines to be insulated with asbestos. CA3-JA 1287-1289, 1291, 1293, 1297-1298 (Westinghouse analogized asbestos blankets to "topcoats," proclaiming its "Tailors Make Topcoats for Turbines."). Petitioners frequently supplied spare asbestos parts (in some cases hundreds of them) for use with their machinery. CA3-JA 1151-1153.

From 1969-1989, Mr. McAfee served as a boatswain's mate in the U.S. Navy aboard numerous ships. Especially from 1977-1980, Mr. McAfee was exposed to asbestos from the process of removal and replacement of gaskets and packing from Ingersoll Rand compressors on the *U.S.S. Wannamassa*. He was similarly so exposed aboard the *U.S.S. Commodore*. JA 486-572.

2. Petitioners' manuals required routine maintenance of the machines, which exposed users to asbestos dust.

Petitioners' machines required constant maintenance. Resp.App.C 18a-19a. Each manufacturer supplied a maintenance manual with its machinery. JA 272, 364, 377, 407.

Mr. DeVries trained his sailors to follow the instructions in petitioners' maintenance manuals, which detailed the type and frequency of maintenance required. Resp.App.G 154a-155a. When the machines leaked, petitioners' maintenance manuals directed sailors to replace the gaskets and/or packing. JA 304-308. The heat and pressure from the machinery caused the gaskets to fragment and stick to the sealing surfaces of the machines. JA 321-322; Resp.App.G 157a. Mr. DeVries and his sailors had to use wire brushes to "perfectly clean" the sealing

surfaces of petitioners' machines of asbestos residue so the new gasket would form a tight seal. This created clouds of asbestos dust. JA 279, 307, 319, 380, 792; Resp.App.G 157a.

Asbestos "stuffing" or "packing" was required to prevent liquid or steam from leaking. Mr. DeVries and his men constantly put new asbestos stuffing in the "stuffing boxes" of petitioners' machines. JA 279, 307; Resp.App.C 18a-19a. The asbestos packing became brittle with use, and created dust upon its removal and replacement. JA 275-276. The men "repacked and repacked and repacked" the Buffalo, Warren, and DeLaval pumps. Resp.App.G 150a. This created clouds of asbestos dust. JA 275-276, 303.

Finally, to access the machinery, the sailors had to remove asbestos blanket and cement insulation required to insulate the machines. This created clouds of asbestos dust. JA 290-291, 794; Resp.App.A 6a; Resp.App.C 18a.

3. Petitioners' maintenance manuals and machine labels did not warn of the hazards of breathing asbestos dust.

Mr. DeVries had "no knowledge of the dangers of asbestos." JA 326. As a result, he did not tell his men to take precautions. JA 309-310; Resp.App.A 2a. There were no asbestos warnings on any of petitioners' machines nor in any of petitioners' maintenance manuals. JA 326, Resp. App.A 7a; Resp.App.G 157a. And there was no "training and other means" by which the Navy warned of the "long-term hazards" of asbestos. *Cf.* Pet.Br. 33. Thus, both he and his men breathed the dust unprotected.

B. Petitioners, and not the Navy, designed their machines to require use of asbestos parts.

Petitioners claim the Navy "added" the asbestos-containing materials "to the defendants' machines after the defendants delivered it [sic] to the Navy" Pet.Br. 3; that their "product" was merely a piece of "bare metal;" and they had no role in the use of asbestos parts in and on their machines. This is contrary to the evidence proffered by both respondents and petitioners' own experts.

1. The Navy viewed the petitioners' machines, their necessary asbestos parts, and manuals as integrated units.

First, the Navy considered petitioners' machines, their necessary asbestos parts, and their maintenance manuals to be a single unit. For example, the Navy defined a boiler and its asbestos parts as a "completely integrated unit" consisting of "such appurtenances as covered herein required for safe continuable [sic] and controllable generation of steam," including "brickwork and insulation." CA3-JA 951. "[S]uppliers of such equipment usually supplied asbestos products with/on/in their equipment." JA 484. Petitioners were also "engaged by the Navy to participate in renovation and overhaul of their own equipment, or that of others, including asbestos-containing parts in shipyard repairs." JA 484. Additionally, petitioners "frequently supplied replacement asbestos or disturbed previously-supplied asbestos as part of their activities on ships." JA 484. And "[g]enerally, if a company supplied asbestos with its equipment, some of that asbestos was always present unless the record shows that the asbestos installed by the defendants was entirely removed." JA 484.

Moreover, petitioners were required to revise their maintenance manuals when different equipment or parts were substituted in place of those originally specified. CA3-JA 730, MIL-M-15071, ¶ 2.5 (1950); *accord* CA3-JA 794, MIL-M-15071C ¶¶ 3.1.6.2-3.1.6.3 (1957). So, if industry developed suitable non-asbestos replacement parts that made petitioners' equipment safer, petitioners were required to update their maintenance manuals to reflect these safer alternatives. There is no evidence petitioners ever supplemented or revised their maintenance manuals to direct the use of any non-asbestos parts.

2. Petitioners sold machines requiring asbestos parts to both the military and civilian markets.

Second, petitioners' suggestion that their machines were only used with asbestos parts at the Navy's behest is contradicted by the fact that petitioners designed and manufactured their machines with asbestos parts for both the government and civilian markets. This is because in high-temperature, high-pressure environments, "industry" standards specified that asbestos must be used with the machinery. JA 303; Resp.App.B 11a. Moreover, contrary to petitioners' claim that petitioners' products were "dictated by the Navy's precise specifications," Pet. Br. 3, the Navy does not actually design the machinery. The Navy issues "a request for bids from qualified contractors in an effort to identify a contractor with the capability and capacity to create a design and manufacture a [product] that satisfies its new military requirements." JA 27, Horne Affidavit ¶10.

Mr. DeVries testified that petitioners specified the type of insulation. CA3-JA 355. Petitioners' machines

contained asbestos-containing parts as necessary components — by petitioners' design — at the time petitioners sold their machines to the Navy. JA 394-396, Testimony of Foster Wheeler MKP, Richard Johnson, at 226-228; JA 484, Faherty Aff. at ¶¶ 39-45. In most cases, these asbestos components were already sealed inside the machine when it was delivered to the customer. *Id.* In other cases, where the machine was too large to be shipped intact, the machine was assembled at the shipyard under the supervision of "competent engineer(s)" provided to the shipyard by petitioners, and the internal asbestos component parts were assembled into the machine at that time. JA 33 Horne's affidavit ¶¶ 19, 24; JA 394-396; Testimony of Foster Wheeler MKP at JA 226-228.

Although it is true certain products were shipped without external asbestos insulation preinstalled, this occurred because (1) "it was more economical, efficient and allowed pre-operation inspection and testing" if the equipment was not shipped with pre-installed insulation, and (2) "the Navy was concerned that pre-installed insulation . . . could be easily damaged during shipment." JA 35, ¶ 24. Preinstalled or not, respondents presented evidence that petitioners directed that their machines be insulated with asbestos.

3. Petitioners' machines would not work without asbestos parts.

Third, the only materials that would work for high temperature applications like petitioners' steam-driven equipment were asbestos-containing parts. CA3-JA 329; Resp.App.E 46a, Woodruff Affidavit re: steam driven equipment. Petitioners concede that, prior to the late

1970s, there were no "acceptable substitutes" for the asbestos components that were required for petitioners' machines to function as designed. Pet.Br. 5.

Thus, Petitioners' claim that they had "no control over the third party products that are added to their equipment post-sale," Pet.Br. 14, is belied by the fact that their machines — both military and civilian — required asbestos parts to work.

Petitioner Foster Wheeler's corporate representative agreed that "asbestos gaskets and tape would have been incorporated within the Foster Wheeler product when it left the factory." JA 395-396. Similarly, Foster Wheeler's internal insulation standards dictated the type of asbestos insulation for use with its products, and were incorporated by reference into Foster Wheeler's subcontracts for the provision of these asbestos parts. JA 391-392. When asked whether Foster Wheeler knew in the 1940s that asbestos parts were used on its equipment, Foster Wheeler's corporate representative responded that it was "obvious" because Foster Wheeler specified them "for use in specific required applications." JA 393.

Buffalo Pumps' maintenance manual for its Navy pumps shows that its pumps were supplied with internal asbestos parts at the time of their initial sale to the Navy. CA3-JA 375-404. Buffalo Pumps also supplied drawings dictating where to put asbestos insulation on their pump. CA3-JA 374.

Westinghouse supplied its machinery with "gaskets in equipment" and "steam & gas turbines and ancillary insulation." JA 439-442; CA3-JA 643-665, 672-676.

Westinghouse proclaimed in 1950 that "[e]very turbine needs asbestos insulating blankets to conserve the power-giving heat." CA3-JA 671.

With respect to gaskets and packing, Mr. DeVries testified that he was trained that "all engineers, not just Navy people, at that time said you would use asbestos for high temperature applications." JA 322. Non-asbestos substitutes for these applications did not become available until the 1980s. CA3-JA 406, Kraft for Buffalo.

Buffalo's pumps were shipped with asbestos-containing gaskets and packing until the early 1980s, when it began attempting to use non-asbestos substitutes. CA3-JA 406-408. Buffalo admitted that "[i]n the 1980s, gaskets and packing materials containing asbestos became generally unavailable while, at the same time, suitable replacement products . . . were becoming available." *May v. Air & Liquid Sys. Corp.*, 129 A.3d 984, 992 (Md. 2015).

C. Replacement asbestos parts were identical to the original asbestos parts.

The asbestos parts that petitioners' machinery required to function were "wear items" that had to be replaced with identical asbestos parts. Thus, Westinghouse's instructions for its marine turbines required asbestos gaskets to be used as replacement parts. JA 447.

Petitioners' maintenance manuals instructed users to repeatedly remove and replace these asbestos-containing parts with ***identical*** asbestos-containing parts, and petitioners profited by selling asbestos replacement parts.

Westinghouse sold asbestos replacement parts to the Navy for Westinghouse forced draft blowers. JA 453-454. When Foster Wheeler sold boilers to the Navy, it provided 200% of the gaskets needed for the manholes and handholes, the internal joints in drums, and the burners. CA3-JA 971. Additionally, Foster Wheeler sold tools for cleaning asbestos-gasket residue off the metal surfaces of their machines. CA3-JA 972. Foster Wheeler sold 992 spare gaskets just for the economizers, alone, on *U.S.S. Turner*. JA 383-384.

D. Petitioners insured against the dangers posed by the use of their machines, which included coverage for asbestos exposure.

Petitioners purchased insurance that covered the risk of asbestos exposure from the use of their machines. General Electric had both primary insurance coverage and excess coverage that applied to personal injury claims for exposure to asbestos from external insulation used on its machines from the 1950s through the 1990s. *Appalachian Ins. Co. v. GE*, 863 N.E.2d 994, 995 (N.Y. 2007).

In 1997, Westinghouse received $121,513,661.70 in settlement of litigation with some, but not all, of its excess insurance carriers for claims arising from asbestos exposure from its machines. *Westinghouse Elec. Corp. v. Am. Home Assur. Co.*, 2004 N.J. Super. Unpub., 2004 Westlaw 1878764 (July 8, 2004).

Buffalo carried both primary and excess insurance coverage for asbestos injuries arising from its pumps. *Air & Liquid Systems Corp v. Allianz Underwriters*

Ins. Co., 2013 U.S. Dist. 2013 Westlaw 5436934 (Sept. 27, 2013 W.D. PA). Like the other petitioners, Foster Wheeler purchased insurance to cover asbestos claims arising from the use and maintenance of its machines. *See Certain Underwriters at Lloyd's, London v. Foster Wheeler Corp.*, 822 N.Y.S.2d 30 (N.Y. App. Div. 2006).

Defendant IMO Industries, Inc.'s predecessor, DeLaval, purchased over ***$1.85 billion*** dollars of insurance coverage – "sufficient to pay for its anticipated liabilities and defense costs for asbestos-related personal injury claims." *IMO Indus. Inc. v. Transamerica Corp.*, 101 A.3d 1085, 1091 (N.J. Super. Ct. App. Div. 2014).

E. The Navy required petitioners to warn users of their machines of the dangers they would face, including asbestos dust.

1. The Navy warning requirements were not limited to hazards that cause "immediate harm."

Petitioners argue that the Navy would allow warnings only as to "immediate" harm. Pet.Br. 33. On the contrary, the "Navy required manufacturers not only to warn on the products but to supply manuals containing warnings to each ship and precautions for the use of the product." These required warnings included asbestos warnings. JA 585-6, 588-89, 590. Moreover, "[b]ased on the SECNAV instruction, the MIL-T-15071 series, and the MIL Standard 129 series, suppliers were required to label asbestos as hazardous." Resp.App.E 91a-100a.

The World War II-era General Specifications for Machinery S1-1 required contractors to include "Safety precautions" in their maintenance manuals. CA3-JA 743. By the 1950s, the Navy became more emphatic in the MIL-M-15071 series, telling petitioners to use the word "WARNING" for "Operating procedures, practices, etc. which will result in personal injury or loss of life if not correctly followed" in the operation, repair, overhaul and maintenance of the equipment. JA 783, ¶¶ 3.3.6; JA 782-3. Nowhere does the Navy state that "personal injury" warnings must apply only to "imminent threats." *Cf.* Pet. Br. 33.

2. The DOD required warnings for toxic and carcinogenic dust.

The Department of Defense ("DOD") required petitioners to mark their products and packaging in accordance with MIL-STD-129, which incorporated the industry warning standard, Manufacturing Chemists Manual, L-1. That standard required warnings for toxic and carcinogenic "dust." JA 482, Faherty Aff. at ¶¶22-28; JA 648-651, Frank Affidavit.

Contrary to petitioners' assertion that there was a "Navy-specific" warnings regime, DOD policies regarding warnings were expressly designed to mirror existing civilian industry standards. This ensured consistent warnings. The Navy expressly preferred petitioners to provide their standard civilian maintenance manual with their machines. JA 586. And the maintenance manuals provided by machinery manufacturers to the Navy contained a myriad of warnings tracking the nomenclature of the MCA Warning Label Guide – but

not the MCA Warning Label Guide as to asbestos. Resp. App.E 90a-100a.

3. By the 1980s, petitioners warned about asbestos with no resultant "overwarning" phenomenon.

Petitioners contend that warnings from machinery manufacturers to Navy users would have resulted in "overwarning," disrupted military discipline, and confused sailors. Pet.Br. 33. There is not a shred of evidence that any of petitioners' decision-makers decided against warning users based upon a concern about "overwarning." And petitioners have produced no evidence that, when petitioners finally started warning in the 1980s, this impaired military discipline or confused sailors.

F. Proceedings Below.

Mr. DeVries and Mr. McAfee developed cancer as a result of their exposures to asbestos, and filed suit against petitioners in state court.

Petitioners argue that respondents sued them because they could not sue the Navy. Pet.Br. 9. That is false. General maritime law recognizes concurrent causation. Parties whose actions are proximate causes of harm are subject to joint and several liability. *McDermott v. AmClyde*, 511 U.S. 202, 220-21 (1994); *Edmonds v. Compagnie Generale Transatlantique*, 443 U.S. 256, 273 n.30 (1979). Petitioners' negligence contributed to cause respondents' diseases. That is why they were sued. That the respondents have no tort cause of action against the Navy is no different than any other workplace injury in a state with a workers' compensation bar. To the extent

petitioners wish to argue that the Navy was the *sole* cause of respondents' injuries, the *Boyle* defense and superseding cause defense will be available to them on remand.

Petitioners removed the cases to federal court under 42 U.S.C. § 1442. The district court granted summary judgment to petitioners, holding they had blanket immunity under the so-called "bare metal" defense. The district court did not reach any other basis for summary judgment, including the government contractor defense under *Boyle*. Pet.App. at 70a; *see also* Pet.App. at 61a, 78a, 86a-87a.

In the first appeal, the Third Circuit remanded to the district court to clarify whether its holding applied to both plaintiffs' strict liability and negligence claims. Pet.App. 47a, 51a. The district court confirmed that its ruling applied to both theories of liability. Pet.App. 42a.

In the second appeal, the Third Circuit held respondents failed to preserve their strict liability claim, and expressly limited the question presented to the application of the "bare metal" defense under general maritime negligence law. As to the negligence claim, the Third Circuit framed the issue as whether a manufacturer who delivers a product "bare-metal" — "without the insulation or other material that ***must*** be added for the product's proper operation" — could be liable in negligence for the foreseeable injuries caused by use of the product. Pet.App. 2a (emphasis added). Under "bedrock principles of maritime law," the Third Circuit held that, in a "negligence claim," "a manufacturer of even a bare-metal product" ***may*** be liable for an asbestos-related disease

"when circumstances indicate the injury was a reasonably foreseeable result of the manufacturer's actions." Pet.App. 3a. The Third Circuit rejected the district court's "bright line approach" that manufacturers can never have liability for respondents' negligence claims. *Id.*

The Third Circuit recognized a potential split in authority — one line of cases holding that a manufacturer of "bare-metal products" is never liable for asbestos components, *see e.g. Lindstrom v. A-C Prod. Liabl. Tr.* 424 F.3d 488, 492 (6th Cir. 2005) — and the other line applying a traditional "fact specific" inquiry regarding whether the plaintiff's injury was a "reasonably foreseeable result of the manufacturer's conduct." Pet.App. 6a (citing *Quirin v. Lorillard Tobacco Co.*, 17 F. Supp. 3d. 760, 768-70 (N.D. Ill. 2014)).

The Third Circuit held that the "doctrinal root" of the "bare metal" defense could be found in both causation and duty, because the "keystone is the concept of foreseeability." Pet.App. 7a. "In the duty element in a negligence action, foreseeability limits a defendant's liability to only the risks and plaintiffs that are reasonably foreseeable." Pet.App. 8a (citing Restatement (Third) of Torts: Phys. & Emot. Harm § 7 Comment j (2010 Am. Law Inst.) (acknowledging "widespread use" of foreseeability as an aspect of reasonable care)). "[I]n proximate cause, foreseeability limits a defendant's liability to only the injuries that are a reasonably foreseeable result of the defendant's actions." Pet.App. 8a (citing *Id.* § 29, Comment. J).

The Third Circuit applied fundamental principles of general maritime law to resolve this potential split between bright-line rules and fact-specific standards. The "humane and liberal character" of general maritime law obliged courts to "give than to withhold the remedy" wherever "established and inflexible rules" do not require otherwise. Pet.App. 12a, (citing *Moragne v. States Marine Lines, Inc.*, 398 U.S. 375, 387 (1970)). Moreover, the Third Circuit held that the "traditions of simplicity and practicality" favored by maritime law warranted application of the principle of foreseeability, which is a "familiar and key part of tort law." Pet.App. 13a-14a (citing *Kermarec*, 358 U.S. at 631-632).

Applying these core maritime doctrines, the Third Circuit held that a manufacturer *may* be subject to liability in negligence if it could have reasonably known that: (1) asbestos is hazardous; and (2) the product will be used with an asbestos-containing part, because (a) the product was originally equipped with an asbestos-containing part that could reasonably be expected to be replaced over the product's lifetime; (b) the manufacturer specifically directed that the product be used with an asbestos-containing part; or (c) the product required an asbestos containing part to function properly. Pet.App. 15a-16a. The Third Circuit remanded the case to the District Court to determine whether summary judgment was warranted on respondents' negligence claims in light of its holding. Pet.App. 17a. Further, the Third Circuit declined to address petitioners' *Boyle* defense, leaving that issue to the district court. Pet.App. 17a.

Petitioners urge reversal because courts "cannot recognize a duty based entirely on the foreseeability of

the harm at issue." Pet.Br. 42. The Third Circuit did not arrive at its decision until it considered each of maritime law's prevailing policy interests — uniformity, simplicity, protection of maritime commerce and solicitude for sailors. Moreover, its test is not limited to foreseeability. Element (1) of the test involves the manufacturer's actual or constructive knowledge of the hazards of asbestos. Element (2) deals with foreseeability, but based only on active *conduct* by the manufacturer – what the manufacturer supplied, directed or required. Put simply, the Third Circuit held that a machinery manufacturer *may* be liable in negligence if it (1) knew of the dangers of asbestos; (2) took action that would cause the user of the machine to be exposed to asbestos; and (3) failed to warn of these known dangers.

SUMMARY OF ARGUMENT

A manufacturer's duty to warn of the foreseeable hazards arising from use of its products is one of the most basic tenets of maritime law and traditional tort law. This tenet applies to situations where a manufacturer knowingly incorporates and requires the use of a dangerous component-part in its product. Petitioners criticize any rule that may hold them responsible for "asbestos-containing materials" "added" to their machinery "years after the equipment's manufacture and sale" by "the Navy or some other third party." Pet.Br. 12. But petitioners ignore that (a) their machines contained those parts at the time of sale; (b) they knew at the time of sale that their machinery would require those asbestos parts to function; (c) they knew those asbestos parts would inevitably require asbestos-containing replacements; and (d) they knew the asbestos parts would create hazardous asbestos dust

every time their machines were maintained as petitioners directed. When a case presents these circumstances, the Third Circuit correctly held that there would be a duty to warn of the danger arising from the expected and intended use of petitioners' machines. Pet.App. 16a.

I. Petitioners' request that this Court eliminate foreseeability and "reasonable care" from maritime law is irreconcilable with this Court's established maritime precedent. In *Kermarec*, this Court held that maritime negligence defendants are held to a "duty of reasonable care under the circumstances of each case." *Kermarec*, 358 U.S. at 632. In *East River*, this Court incorporated *Kermarec's* standard, stating that product liability negligence claims are "grounded in principles already incorporated into maritime law." *East River*, 476 U.S. at 866. Following these established principles, the Third Circuit crafted a carefully delineated test for a duty of care, applied "on a case-by-case basis," but circumscribed by the strict parameters of foreseeability as mandated by this Court in *Exxon Co. v. Sofec*, 517 U.S. 830 (1996), and other cases. Pet.App. 16a. The Third Circuit's test aligns with, and is compelled by, the holdings in *Kermarec* and *East River*.

II. The Third Circuit's test accords with traditional maritime doctrine. The Third Circuit rejected the concept of unlimited liability. Rather, it applied a balanced rule finding a duty only when an asbestos component was "essential to the proper functioning of the defendant's product, or was for some other reason so inevitable that, by supplying the product, the defendant was responsible for introducing asbestos into the environment at issue." Pet.App. 6a, 16a; *see also Quirin*, 17 F. Supp. 3d at 769-70.

This balanced rule properly applies traditional principles of tort law (limiting liability based on foreseeability), and maritime law's principles that manufacturers are held to a "duty of reasonable care under the circumstances of each case." *Kermarec*, 358 U.S. at 631; *East River*, 476 U.S. at 866. Applying petitioners' exception to maritime negligence law by eliminating foreseeability and isolating one component of their otherwise integrated machines would defeat maritime law's goals of uniformity and simplicity.

III. The overwhelming majority of state court cases that have addressed this "bare metal" defense have rejected the blanket immunity advocated by petitioners, and applied a rule consistent with the Third Circuit's rule. Petitioners' argument would require this Court to adopt a rule that is "disfavored by a clear majority of the States." *Miles v. Apex Marine Corp.*, 498 U.S. 19, 36 (1990).

IV. In addition to comporting with maritime law and a clear majority of the states, the Third Circuit's rule mirrors traditional tort doctrine. A manufacturer has a duty to warn of the hazards arising from the intended and expected use of its product. Restatement (Second) of Torts, § 388, Comment (a). This duty applies even when the harm involves a part manufactured by a third party, and the part is required for the proper functioning of the manufacturer's machinery. Indeed, the cases petitioners cite confirm the continued vitality of this principle. Pet.Br. 14 (citing *Reynolds v. Bridgestone/Firestone*, 989 F.2d 465, 471 (11th Cir. 1993) (holding that tire rim manufacturer liable for injuries caused by exploding tire made by a *third party*, because if "the manufacturer knows or should know that the goods can create danger when used in

their customary manner, the manufacturer must exercise reasonable diligence to make such danger known to the persons likely to be injured by the product.")).

V. The assumptions underlying petitioners' assertion that a manufacturer cannot control the risks associated with every product that might foreseeably be used in conjunction with its own product, Pet.Br. 44-45, are fully addressed by the Third Circuit's rule. The rule imposes a duty only when a manufacturer knew or reasonably could have known (1) that asbestos is hazardous; ***and*** (2) "its product will be used with an asbestos-containing part" because (a) the manufacturer originally sold its machine with an asbestos part it reasonably expected to be replaced over the product's lifetime, (b) "the manufacturer specifically directed that the product be used with an asbestos-containing part, or (c) the product required an asbestos-containing part to function properly." Pet.App. 15a-16a. Petitioners were in the best position to warn of the hazards arising from use of their products, both from a practical perspective (they sold their products with maintenance manuals), and from an economic perspective. Petitioners designed their machinery to require asbestos parts, profited from the sale of this integrated machinery, and passed on to their customers the cost of insurance for future harms arising from use of their machines.

VI. Petitioners' contention that the Navy would not allow them to warn has no relevance to the question presented. The government contractor defense is not before this Court. *See Boyle v. United Technologies Corp.*, 487 U.S. 500 (1988). Moreover, the narrow issue of what the Navy did or did not do in this case has no relevance to the global question of whether under general maritime

law a manufacturer has a duty to warn of dangers arising from use of its product. And in any event, respondents' evidence to the contrary must be credited over petitioners' competing evidence at summary judgment.

VII. In essence, the Third Circuit's test is an "inevitability" test that provides clear guidelines to courts and litigants, while simultaneously adhering to this Court's maritime precedent imposing a simple rule of reasonable care under the circumstances. It balances maritime law's goals of providing "special solicitude" to the sailor based on uniform rules. Petitioners' contention that this Court should abandon the concept of foreseeability in negligence law would upend a century of this Court's jurisprudence and create chaos across every area of maritime law in which principles of negligence, proximate cause (including superseding cause), and foreseeability are routinely applied by the courts. Because petitioners were in the best position to warn, test, and insure against the foreseeable harm arising from the use and maintenance of their own machinery, this Court should affirm.

ARGUMENT

I. The Third Circuit's holding is compelled by this Court's maritime precedent.

A. Maritime law has long recognized negligence, including its foreseeability test.

This case arises under federal maritime law. *See Jerome B. Grubart, Inc. v. Great Lakes Dredge & Dock Co.*, 513 U.S. 527, 536 (1995). "With admiralty jurisdiction comes the application of substantive admiralty law."

East River, 476 U.S. at 864. "Absent a relevant statute, the general maritime law, as developed by the judiciary, applies." *Id.* "Drawn from state and federal sources, general maritime law is an amalgam of traditional common-law rules, modifications of those rules, and newly created rules." *Id.* at 864-865. Petitioners concede that no maritime statute governs this case. Pet.Br. 18. Thus, the issue presented turns purely on general maritime law.

This Court has developed a body of maritime tort principles. *East River* recognized "products liability, including strict liability, as part of the general maritime law." *East River*, 476 U.S. at 865. *East River* held that "[t]o the extent that products actions are based on negligence, they are grounded in principles already incorporated into the general maritime law," including a duty of reasonable care under the circumstances. *Id.* (citing *Kermarec*, 358 U.S. at 632).

"The general maritime law has recognized the tort of negligence for more than a century . . . ." *Norfolk Shipbuilding & Drydock Corp. v. Garris*, 532 U.S. 811, 820 (2001). This Court has repeatedly held that general maritime negligence, though derived from common law negligence, is uniquely maritime in nature. *See, e.g., id.* at 815 (maritime negligence "is no less a distinctively maritime duty than seaworthiness: The common-law duties of care have not been adopted and retained unmodified by admiralty, but have been adjusted to fit their maritime context"); *Moragne*, 398 U.S. at 386-87 ("Maritime law had always . . . been a thing apart from the common law."); *Kermarec*, 358 U.S. at 630 ("The issue must be decided in the performance of the Court's function in declaring the general maritime law, free from inappropriate common-law concepts.").

B. Petitioners' proposed blanket immunity is antithetical to maritime law.

Petitioners' request that this Court abandon *Kermarec's* reasonable care standard, principles of foreseeability, and solicitude for the welfare of sailors would upend general maritime negligence law.

1. Maritime negligence law applies a duty of reasonable care under the circumstances of each case.

First, as set forth above, since this Court decided *Kermarec* nearly sixty years ago, all general maritime negligence cases have been held to a simple, uniform duty of "reasonable care under the circumstances of each case." *Kermarec*, 358 U.S. at 632.

This Court expressed a clear intent that products liability claims sounding in negligence would be held to the same *Kermarec* standard as any other negligence case. When this Court recognized maritime strict products liability claims in *East River*, it stated, "to the extent that products actions are based on negligence, they are grounded in principles already incorporated into the general maritime law." *East River*, 476 U.S. at 866 (citing *Kermarec*, 358 U.S. at 632). Petitioners ignore principles of *stare decisis* and ask this Court to reject this longstanding precedent to carve out a special exception just for them. Deviating from the simple *Kermarec* negligence standard would impair maritime uniformity.

2. Maritime law holds that a product is the entire "integrated package," including its asbestos parts and maintenance manual.

Second, petitioners' claim that the "product" is not their integrated product — but instead only the necessary and identical replacement asbestos parts — subverts this Court's holding in *East River* that machines are to be judged as an "integrated package," and not deconstructed to their "component parts." *East River*, 476 U.S. at 867. To the extent this case has anything to do with the identity of the product, as opposed to petitioners' conduct, the products sold by petitioners were the operating machines, with all their requisite parts and their required maintenance manuals. The replacement asbestos parts were not "added" later unbeknownst to petitioners. Pet. Br. 3. Petitioners specified asbestos parts so that their machines would work and sold the asbestos parts with the original integrated product.

Petitioners seek to overturn *East River's* "integrated product" rule in favor of a special carve-out by which courts must disassemble petitioners' machines into a pile of individual component parts. A rule that carves out specific necessary parts from integrated machines and defines them as the only "real" products constitutes "conceptual distinctions [that] would be foreign to its traditions of simplicity and practicality." *Kermarec*, 358 U.S. at 634. This, likewise, would impair maritime law's uniform integrated package rule.

3. Blanket immunity for petitioners would unfairly require shipyards and ship owners to pay for petitioners' negligence.

Third, as a policy matter, petitioners' rule of blanket immunity would unduly burden maritime commerce and result in a heavier burden on core maritime actors—shipyards and ship owners. Currently, both shipyards and ship owners may be held liable in negligence for injuries caused by asbestos products installed on board their ships, even if those products were manufactured by others, including petitioners. *See e.g., Savoie v. Huntington Ingalls, Inc.*, 817 F.3d 457, 459 (5th Cir. 2016), *cert. denied*, 137 S. Ct. 339 (2016) (shipyard); *Miller v. Am. President Lines, Ltd.*, 989 F.2d 1450, 1453 (6th Cir. 1993) (ship owner). The same district court judge who presided over this case found that shipyards are subject to *Kermarec's* duty of reasonable care under the circumstances in negligent failure to warn claims arising from exposure to products manufactured by others and installed at the shipyard. *Filer v. Foster Wheeler LLC*, 994 F. Supp. 2d 679, 693 (E.D. Pa. 2014).

To avoid absorbing the full amount of damages in such cases, shipyards and ship owners routinely file cross-claims and third-party claims against defendants, including petitioners, who manufactured and supplied the machines giving rise to the asbestos exposure. *See, e.g., Miller*, 989 F.2d at 1453; *Vaughn v. Farrell Lines, Inc.*, 937 F.2d 953, 958 (4th Cir. 1991) (approving noncontractual indemnity claim by ship owner against Foster Wheeler). If this Court grants petitioners' blanket immunity, shipyards and ship owners will not be able obtain noncontractual indemnity or contribution from petitioners. Rather than

spreading the cost amongst all responsible parties, petitioners' rule would unfairly concentrate liability on those who did not actually supply the machines that required use of asbestos parts.

This impact would extend far beyond the facts of this case. Consider, for instance, an industrial table saw manufacturer who provides a saw to a shipyard. Such saws normally contain warnings and safety devices to protect people from the blade. A saw blade, however, is a wear item that must routinely be replaced. If the shipyard purchases an identical replacement blade —as specified by the saw manufacturer — from an aftermarket supplier, does that mean that the saw manufacturer no longer has a duty to warn of the expected hazards of its saw? Is a nail gun manufacturer absolved of any duty to warn of the foreseeable hazards of its own nail gun when used as intended and expected with nails that the gun manufacturer specified but did not supply?

Also consider Foster Wheeler's economizers, which Foster Wheeler sold with the original asbestos gaskets sealed inside and an additional 992 spare gaskets. JA 383-384. When gasket number 993 is installed, does Foster Wheeler's duty to warn vanish? And if Foster Wheeler had included warnings in its maintenance manual and on its machine for its original gaskets and the 992 spare gaskets, should it now remove those warnings because the 993rd gasket — identical in all respects and giving rise to the exact same hazard — happened to come from an aftermarket supplier?

4. Solicitude for sailors is not an "outdated" policy.

Finally, maritime law holds that "'it better becomes the humane and liberal character of proceedings in admiralty to give than to withhold the remedy, when not required to withhold it by established and inflexible rules.'" *Yamaha Motor Corp., U.S.A. v. Calhoun*, 516 U.S. 199, 213 (1996) (citing *Moragne*, 398 U.S. at 387 (quoting *The Sea Gull*, 21 F.Cas.909, 910 (C.C.Md. 1865))). While the result urged by respondents is not dependent upon this long established doctrine, it would be perverse if the doctrine were jettisoned in this case in favor of a rule far more restrictive than the prevailing law on land. *See* Section III *infra*.

Moreover, petitioners' claim that maritime law no longer requires a special solicitude for sailors because the seas have become safe is unsupported by the facts. For example, commercial fishing remains "one of the most dangerous occupations in the United States." Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Reporter, 59(27);842-845 (July 16, 2010), available at https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5927a2.htm (last visited Aug. 19, 2018). The relative risk for increased deaths among commercial fishermen as compared with all United States workers is staggering: "During 1992-2008, an annual average of 58 reported deaths occurred (128 deaths per 100,000 workers)[ ], compared with an average of 5,894 deaths (four per 100,000 workers) among all U.S. workers." *Id.*

Yet based on nearly 85-year-old *dicta* in *Warner v. Goltra*, 293 U.S. 155, 162 (1934), petitioners contend that

solicitude for maritime workers is an "outdated" policy from a bygone era. Pet.Br. 34-35. Petitioners fail to explain why, if this policy is allegedly no longer valid, this Court has continued to apply it for the last 125 years. As noted above, in both *Moragne* and *Yamaha* this Court based its unanimous decisions heavily upon this policy. *See Yamaha*, 516 U.S. at 213; *Moragne*, 398 U.S. at 387; *see also Am. Exp. Lines, Inc. v. Alvez*, 446 U.S. 274, 281-82 (1980); *Sea-Land Servs., Inc. v. Gaudet*, 414 U.S. 573, 583 (1974).

In *The Max Morris v. Curry*, 137 U.S. 1, 14-15 (1890), this Court unanimously rejected a strict contributory negligence rule on the principle that "the more equal distribution of justice, the dictates of humanity, the safety of life and limb, and the public good, will be best promoted[.]" *Id.*; *see also Pope & Talbot v. Hawn*, 346 U.S. 406, 411 (1953). In 1959, this Court unanimously rejected complex and differing standards of care based on the identity or status of the parties at issue in the case and adopted a simple, uniform "duty of reasonable care under the circumstances of each case" for all negligence actions. *Kermarec*, 358 U.S. at 631.

In 1970, this Court unanimously rejected the traditional common law proscription against wrongful death claims, basing its decision in part on maritime law's "humane and liberal nature" and "special solicitude for the welfare of those men who undertook to venture upon hazardous and unpredictable sea voyages." *Moragne*, 398 U.S. at 387. In 1996, this Court unanimously rejected an attempt to limit damages available for a maritime casualty because "it better becomes the humane and liberal character of proceedings in admiralty to give than to withhold the remedy, when not required to withhold it by

established and inflexible rules." *Yamaha Motor Corp.*, 516 U.S. at 213 (internal citations omitted). In 2001, this Court unanimously rejected a distinction between death claims for unseaworthiness and negligence, based largely on commonsense "notions of justice" and simplicity. *Garris*, 532 U.S. at 816. In these cases, this Court gave effect to maritime law's humane solicitude for maritime workers and preference for justice and simplicity.

Even cases that ultimately ruled against extension of a maritime remedy recognized the continuing validity of this policy. For instance, in *Miles v. Apex Marine Corp.*, 498 U.S. 19 (1990), this Court noted that "admiralty courts have always shown a special solicitude for the welfare of seamen and their families." *Id.* at 36 (citing *Moragne*, 398 U.S. at 387 (quoting Chief Justice Chase in *The Sea Gull*, 21 F. Cas. 909, 910 (No. 12,578) (CC Md. 1865)), and *Gaudet*, 414 U.S. at 583). However, because Congress had placed limits on recovery in survival actions, the Court was bound to follow the governing statute: "We sail in occupied waters." *Miles*, 498 U.S. at 36. In contrast, petitioners admit that no statutes or inflexible rules are implicated in this case. Because this Court is not sailing in "occupied waters," there is no obstacle to giving rather than withholding the remedy in this case. *Yamaha*, 516 U.S. at 213.

C. Under maritime law, there was no superseding cause.

Petitioners do not dispute that (i) they had a duty to warn the initial users of their machines of the danger of the asbestos-containing components that were included with their products when sold; (ii) they had a duty to

warn all subsequent users of their machines – so long as the necessary asbestos parts being removed were supplied by petitioners; and (iii) their machines required replacement of asbestos components with substantially identical asbestos components. Yet, petitioners argue that an intervening condition arose that relieves them of liability for the hazards inherent in the normal, intended maintenance of their machines.

This is a thinly veiled argument that the replacement of the original asbestos gasket, packing or insulation constituted a superseding cause that excused petitioners' failure to warn at the time they sold their machines, spare parts and maintenance manuals to the Navy. *See e.g., Exxon Co. v. Sofec*, 517 U.S. 830 (1996). In *Sofec*, Justice Thomas, writing for a unanimous Court, held that the doctrine of superseding cause applied to products liability claims under maritime law: "The doctrine of superseding cause is applied where the defendant's negligence in fact substantially contributed to the plaintiff's injury but the injury was actually brought about by a later cause of independent origin ***that was not foreseeable***." *Sofec*, 517 U.S. at 837 (emphasis added).

Petitioners cannot claim that the use of replacement asbestos parts in their machines was "not foreseeable" when their machines required asbestos parts to operate and their maintenance manuals specified asbestos parts and directed their repeated replacement. The predictable replacement of asbestos-containing component parts here does not constitute an unforeseeable superseding cause that breaks the chain of causation any more than refilling the gas tank of the exploding Ford Pinto constitutes a superseding cause of the Pinto's negligent design. *See*

Grimshaw v. Ford Motor Co., 174 Cal. Rptr. 348, 359 (Cal. Ct. App. 1981). Gas was required for the Pinto to run, just like asbestos components were required for petitioners' machines to operate. But the Pinto had been refilled many times before the gas tank exploded, just as the asbestos components had been replaced many times before Mr. DeVries and Mr. McAfee were exposed. Neither changed the defective condition of the product itself — the Pinto in the first example, the machine in this case — to create a hazard "of independent origin that was not foreseeable." Rather, both left the product in exactly the same dangerous condition that it was in when it was first delivered to the purchaser.

Finally, this Court's decision in *Sofec* and many other cases demonstrates that this Court has not considered foreseeability to be an "unworkable" rule in maritime cases. Pet.Br. 14. Indeed, in both *Sofec* and more recently in *Staub v. Proctor Hosp.*, 562 U.S. 411 (2011), this Court had no difficulty applying the doctrine of superseding cause based on foreseeability.

D. In maritime cases, this Court has clearly distinguished between property damage and personal injury claims.

Finally, petitioners contend that maritime law should not distinguish between contract and personal injury cases. Pet.Br. 35. But *East River* held that there is stronger justification for the imposition of a tort duty when the injury is to the person (as opposed to when a product injures only itself), because when a person is injured, the "cost of an injury and the loss of time or health may be an overwhelming misfortune," and one the

person is not prepared to meet. *East River*, 476 U.S. at 871 (quoting *Escola v. Coca Cola Bottling Co.*, 24 Cal. 2d 453, 462 (1944)). In contrast, in contract law, the parties may set the terms of their own agreements. *East River*, 476 U.S. at 872-73. "Since a commercial situation generally does not involve large disparities in bargaining power, we see no risk to intrude into the parties' allocation of the risk." *Id.* at 873 (internal citations omitted). This is not a contract case.

II. The Third Circuit's test accords with maritime law.

A. A test based on reasonable care under the circumstances of each case accords with maritime principles.

The test adopted by the Third Circuit in this case accords with traditional maritime doctrine. The Third Circuit rejected the concept of unlimited liability whereby a defendant might be held liable whenever the use of asbestos in connection with its product was "merely" foreseeable. The Third Circuit also rejected the rule that "a defendant is never liable when the material containing asbestos was supplied by a third party." *Quirin*, 17. F. Supp. 3d at 769. As in *Quirin*, the Third Circuit followed the "middle road," finding a duty "where the use of asbestos-containing materials was specified by a defendant, was essential to the proper functioning of the defendant's product, or was for some other reason so inevitable that, by supplying the product, the defendant was responsible for introducing asbestos into the environment at issue." *Quirin*, 17 F. Supp. 3d at 769-70; Pet.App. 15a-16a.

This balanced rule properly applies traditional principles of tort law (limiting liability based on foreseeability), and maritime law's longstanding "duty of reasonable care under the circumstances of each case." *Kermarec*, 358 U.S. at 631. Notably, this Court in *Kermarec* did not find analyzing the circumstances of each case in a negligence claim antithetical to maritime law's principles; on the contrary, the Court held that this accorded with maritime law's "traditions of simplicity and practicality." *Id.* at 631.

Moreover, contrary to petitioners' parade of horribles that this "free-wheeling" approach would provide a "mess" for the lower courts (Pet.Br. 43), the Third Circuit's test is simple:

First, did the manufacturer have actual or constructive knowledge that asbestos is hazardous? If yes, then continue to the second part of the test. If not, there is no duty.

Second, did the manufacturer know or should the manufacturer have known that its product would be used with asbestos-containing parts based on its own affirmative conduct? If yes, then there is a duty to warn. If not, there is no duty.

Other recent maritime cases have adopted this "middle road" test, which requires that the manufacturer take an active role in incorporating the asbestos component into the product before a duty arises. *See Osterhout v. Crane Co.*, 2016 WL 6310765, at *3 (N.D.N.Y. Oct. 27, 2016); *Bell v. Foster Wheeler Energy Corp.*, 2016 WL 5780104, at *6 (E.D. La. Oct. 4, 2016); *Hedden v. CBS Corp.*, 2015 WL 5775570, at *14 (S.D. Ind. Sept. 30, 2015); *Kochera v. Foster Wheeler, LLC*, 2015 WL 5584749, at *4 (S.D. Ill. Sept.

23, 2015); *Andrews v. 3M Co.*, No. 2:13-cv-2055, 2015 WL 12831315, at *6 (D.S.C. May 22, 2015), on reconsideration, *sub nom. Andrews v. CBS Corp.*, 2015 WL 12831342 (D.S.C. June 18, 2015), *Chesher v. 3m Co.*, 234 F. Supp. 3d 693 (D.S.C. 2017)

B. *Lindstrom* is limited to strict products liability, and has no bearing on negligent failure to warn claims.

The *Lindstrom* line of cases upon which petitioners rely derive their "bright line rule" based on the principle that, if the exposure to the asbestos arose from a third party's component within the manufacturer's product, then this negates causation. While *Lindstrom's* rule may give rise to a conflict in maritime law under principles of strict liability, in a negligence cause of action, which is the sole issue before this Court, *Lindstrom* is particularly problematic to apply. *See Hedden*, 2015 WL 5775570, at *11 (citing *Lindstrom* for the general principles of causation but nevertheless holding that a defendant may be liable under the circumstances outlined in *Quirin*); *Kochera*, 2015 WL 5584749, at *3 (same); *Andrews*, 2015 WL 12831315, at *6 (distinguishing *Lindstrom* as "a manufacturing defect case [that] did not consider or discuss a failure-to-warn claim").

First, while the district court found that *Lindstrom's* rule applied to both product liability and negligence claims, Pet.App. 34a n. 11, the *Lindstrom* decision itself contains no discussion of failure-to-warn claims. *Andrews*, 2015 WL 12831315, at *6 (distinguishing *Lindstrom* as "a manufacturing defect case [that] did not consider or discuss a failure-to-warn claim"); *Quirin*, 17 F. Supp. 3d at 768 (same). Indeed, the word "duty" does not appear in the opinion.

Second, *Lindstrom's* analysis does not hold in a negligence cause of action, which is focused on the defendant's *conduct. Chesher v. 3M Co.*,, 234 F. Supp. 3d 693, 702 (D.S.C. 2017). "In that situation, the breach does not arise out of the creation of the product itself but instead out of the manufacturer's failure to warn of the danger the product creates." *Id.* (citing Restatement (Second) of Torts § 388 (1965)). In such cases, the plaintiff's burden is to prove a "causal link between his injury and the manufacturer's omission, not the product itself." *Chesher*, 234 F. Supp. 3d at 693. Thus even if this Court were to treat this issue as a causation issue, the predicate for the causal link shifts depending on whether it is a strict liability claim (a defective product) or a negligence claim (an actor's failure to exercise reasonable care under the circumstances).

Finally, *Lindstrom* either failed to consider, or ignored, maritime law's integrated product doctrine. It is only because *Lindstrom* assumed that the "product" in question was the deconstructed asbestos-containing subcomponent, and not the integrated machine itself, that *Lindstrom* found that there was no causation between the "product" and the injury.

III. The Third Circuit's test accords with the prevailing law on land.

In addition to aligning with general maritime law, the Third Circuit's test accords with "the law prevailing on the land." *Igneri v. Cie. de Transports Oceaniques*, 323 F.2d 257, 259 (2d Cir. 1963); *see also Yamaha*, 516 U.S. at 202.

A. A clear majority of the states adopt the same rule as the Third Circuit.

"[T]he recent trend in state court asbestos litigation has been to recognize limited circumstances in which a manufacturer can have duties to warn regarding a product that the manufacturer did not make, sell, or otherwise control." *Bell*, 2016 WL 5780104, at *2 (E.D. La. Oct. 4, 2016).

Indeed, the overwhelming majority of state court decisions apply essentially the same test as the Third Circuit. *See, e.g., In re N.Y.C. Asbestos Litig.*, 59 N.E.3d 458, 471 (N.Y. 2016) ("[T]he manufacturer of a product has a duty to warn of the danger arising from the known and reasonably foreseeable use of its product in combination with a third-party product which, as a matter of design, mechanics or economic necessity, is necessary to enable the manufacturer's product to function as intended."); *McKenzie v. A.W. Chesterton Co.*, 373 P.3d 150, 160-62 (Or. 2016), *review denied*, 381 P.3d 841 (2016) (rejecting "bare metal" defense where it was foreseeable that plaintiff would be exposed to asbestos-containing replacement components); *May v. Air & Liquid Sys. Corp.*, 129 A.3d 984, 1000 (Md. 2015) ("[A] manufacturer will have a duty to warn under negligence and strict liability when (1) its product contains asbestos components, and no safer material is available; (2) asbestos is a critical part of the pump sold by the manufacturer; (3) periodic maintenance involving handling asbestos gaskets and packing is required; and (4) the manufacturer knows or should know the risks from exposure to asbestos."); *Schwartz v. Abex Corp.*, 106 F. Supp. 3d 626, 655 (E.D. Pa. 2015) ("[U]nder Pennsylvania law, a product manufacturer has a duty to

warn about the asbestos hazards of a component part later used with its product, which it neither manufactured nor supplied . . . ., if the manufacturer knew its product would be used with that type of asbestos-containing component . . . ."); *Garvin v. AGCO Corp.*, 2014 WL 8628438, at *7-8 (S.C. Ct. C.P. December 10, 2014) (approving *Quirin* and holding that a manufacturer may be liable for harm caused by asbestos-containing replacement parts when "[the] manufacturer recommends, specifies, or requires that asbestos gaskets and packing be replaced with like materials"); *Macias v. Saberhagen Holdings, Inc.*, 282 P.3d 1069 (Wash. 2012) (imposing liability where a product "inherently and invariably pose[s] [a] danger of exposure to asbestos."); *Whelan v. Armstrong International, Inc.*, 2018 WL 3716036 at *1 (Sup. Ct. of N.J., Aug. 6, 2018) ("We conclude that a duty to warn exists when the manufacturer's product contains asbestos components, which are integral to the function of the product, and the manufacturer is aware that routine periodic maintenance of its product will require the replacement of those components with other asbestos-containing parts.").

If this Court chooses to borrow a landside rule, the Third Circuit's rule comports with the prevailing rule on land. This rule is the rule least likely to cause a disparity of treatment between landside and maritime workers, and the rule most likely to vindicate maritime law's core policies of simplicity, uniformity, and the humane solicitude for maritime workers.

B. The two state court decisions cited by petitioners do not preclude the application of the Third Circuit's test.

The state court decisions that petitioners cite in support of the "bare metal" defense are not inconsistent with the Third Circuit's test. Pet.Br. 29 (citing *Braaten v. Saberhagen Holdings*, 198 P.3d 493 (Wash. 2008), and *O'Neil v. Crane Co.*, 266 P.3d 987 (Cal. 2012)). First, both decisions "stopped short of foreclosing the availability of a failure-to-warn claim . . . where (1) the defendant actually incorporated asbestos-containing components into its original product . . . and (2) the defendant 'specified' the use of asbestos-containing replacement components, or such components were 'essential to the proper functioning' of the product." *Chesher*, 234 F. Supp. 3d at 704.

Braaten expressly declined to analyze the facts at issue in this case. "[W]e need not and do not reach the issue of whether a duty to warn might arise with respect to the danger of exposure to asbestos-containing products specified by the manufacturer to be applied to, in, or connected to their products, or required because of a peculiar, unusual, or unique design." *Braaten*, 198 P.2d at 496. Rather, *Braaten* recognized that while the law "generally does not require a manufacturer to study and analyze the products of others and warn users of the risks of those products," the "general rule does not apply to a manufacturer who incorporates a defective component into its finished product." *Braaten*, 198 P.3d at 498 n.7. The manufacturer of a finished, integrated product "derives an economic benefit from the sale of the product incorporating the defective component and has the ability to test and inspect the component when it is within the

assembler's possession, and by including the component in its finished product represents to the consumer and ultimate user that the component is safe." *Id.*

Subsequently, *Macias v. Saberhagen Holdings, Inc.*, 282 P.3d 1069 (Wash. 2012), held that respirator manufacturers were liable for exposure to asbestos dust from products they did not sell because they "manufactured products that inherently involved the danger of exposure to asbestos when the products were used exactly as intended and for the purpose for which they were intended." *Id.* at 1077, 1079. *Macias* rejected an "absolute rule" that if the "source of the hazardous substance was not the manufacturer's own product, no duty can arise." *Macias*, 282 P.3d at 1080. Thus, as the district court below recognized, in *Macias* the Supreme Court of Washington "retreated" from its previous adoption of the "bare metal" defense in *Braaten*, Pet.App. 23a n.4, and *Braaten's* continued viability is questionable, at best.

Similarly, *O'Neil* expressly did not impose an absolute prohibition on equipment manufacturers' liability for injuries arising from use of their equipment involving asbestos-containing replacement parts. In *O'Neil*, the Court rejected the principle that "mere compatibility" with asbestos parts would impose a duty to warn, but then explained that a "stronger argument for liability might be made in the case of a product that required the use of a defective part in order to operate. In such a case, the finished product would inevitably incorporate a defect. One could argue that replacement of the original defective part with an identically defective one supplied by another manufacturer would not break the chain of causation."

O'Neil, 266 P.3d at 996 n.6. The Third Circuit's holding is explicitly restricted to the circumstances contemplated by footnote 6 of the *O'Neil* decision. Pet.App. 15a-16a.

C. Petitioners' rule would leave maritime workers worse off than land-based workers.

Petitioners claim that their rule would "leave[] sailors no worse off than any tort litigant." Pet.Br. 37. That is not true. Take two shipyard workers who contract asbestos disease from exposures at Sparrows Point Shipyard in Maryland. One worker repairs boiler components that are brought ashore to the boiler shop. His case is governed by *May*, 129 A.3d at 1000, which rejected petitioners' rule. The other worker repairs boiler components that are left in place on ships on navigable waters. That worker's case is governed by the maritime rule this Court adopts. Under petitioners' rule there would be a tremendous disparity in the treatment of these two otherwise identically situated workers.

Such disparity would not be limited to Maryland; the same would be true of maritime workers and Navy service members in New York, Rhode Island, Washington, New Jersey, Oregon and Wisconsin, at the least. *See In re N.Y.C. Asbestos Litig.*, 59 N.E.3d at 483; *Sweredoski v. Alfa Laval, Inc.*, No. PC-2011-1544, 2013 WL 5778533, at *7 (R.I. Super. 2013); *Macias*, 282 P.3d at 1080; *Hughes v. A.W. Chesterton Co.*, 89 A.3d 179, 189 (N.J. Super. Ct. App. Div. 2014), *cert. denied*, 101 A.3d 1082 (N.J. 2014); *McKenzie*, 373 P.3d at 155, *review denied sub nom. McKenzie v. A. W. Chesterton Co.*, 381 P.3d 841 (Or. 2016); *see Spychalla v. Boeing Aerospace Opns. Inc.*, No. 11-CV-497, 2015 WL 3504927, at *4 (E.D. Wis. June 3, 2015).

Even the Supreme Court in California did not go as far as petitioners ask this Court to go but, instead, ruled that a manufacturer may be liable if its "own product contributed substantially to the harm, or the defendant participated substantially in creating a harmful combined use of the products." *O'Neil*, 266 P.3d at 991.

IV. The Third Circuit's test accords with traditional common-law tort principles.

A. Traditional principles of tort law impose a duty to warn of foreseeable dangers of a product.

The Third Circuit's test aligns with not only general maritime law and the predominant law on the land, but also traditional common-law tort principles. For over a hundred years, this Court has recognized that "[i]t is well settled that a man who delivers an article which he knows to be dangerous or noxious, to another person, without notice of its nature and qualities, is liable for any injury which may reasonably be contemplated as likely to result, and which does in fact result, therefrom, to that person or any other who is not himself in fault." *Waters-Pierce Oil Co. v. Deselms*, 212 U.S. 159 (1909); *see also* Restatement (Second) of Torts § 388 (1965).

And since *MacPherson v. Buick Motor Co.*, 111 N.E. 1050 (N.Y. 1916), the law has recognized that the justification for this rule arises from the "foreseeability of harm if proper care is not used;" the "representation of safety implied in the act of putting the product on the market;" and "the economic benefit derived by the manufacturer from the sale and subsequent use of the chattel." Restatement Second (Torts) Section 395

comment (b). Paraphrasing Justice Cardozo, "It was a manufacturer of [machines]. It was responsible for the finished product. It was not at liberty to put the finished product on the market without subjecting the component parts to ordinary and simple tests." *MacPherson*, 111 N.E. at 1051.

By 1945, general maritime law adopted *MacPherson's* holding that a manufacturer is responsible for the foreseeable harms arising from use of its product. *Sieracki v. Seas Shipping Co.*, 149 F.2d 98, 100 (3d Cir. 1945), aff'd, 328 U.S. 85 (1946).

The principle that duty arises from, and is limited by, foreseeability is hornbook law. The *McKown* case cited by petitioners, Pet.Br. 41, reinforces this concept. The *McKown* court stated, "Thus, we have held that foreseeability can be a question of whether duty exists and also a question of whether the harm is within the scope of the duty owed." *McKown v. Simon Property Group, Inc.* 344 P.3d 661, 764 (Wash. 2015).

Petitioners attempt to rely on the Restatement (Second) of Torts §§ 314-315 for the rule that liability is limited to "those within a product's chain of distribution" is misplaced. Pet.Br. 13. Those sections of the Restatement have nothing to do with a manufacturer's liability for the hazards arising from the use of its product. Those sections are limited to the duty to render aid to a person at risk. *See, e.g.*, Restatement (Second) of Torts § 314 at cmt. c, Illus. 1 ("A sees B, a blind man, about to step into the street in front of an approaching automobile."); Restatement (Second) of Torts § 315 at cmt. b ("Thus if the actor is riding in a third person's car merely as a guest, he is not

subject to liability to another run over by the car even though he knows of the other's danger and knows that the driver is not aware of it, and knows that by a mere word, recalling the driver's attention to the road, he would give the driver an opportunity to stop the car before the other is run over.").

B. The manufacturer's duty of care extends to warning about foreseeable dangers arising from its integrated product.

A manufacturer of a product must exercise reasonable care to warn of the hazards arising from the use of its product, including when those hazards arise from parts the manufacturer did not make but necessarily incorporated into its product. This principle is explicitly illustrated in the second Restatement. *See* Restatement (Second) of Torts § 388, cmt. f ("The particulars in which reasonable care is usually necessary for protection of those whose safety depends upon the character of chattels are . . . the selection of material and parts to be incorporated in the finished article . . .").

Contrary to petitioners' sweeping statement that "[t]ort law has never permitted such suits," Pet.Br. 24, petitioner Ingersoll Rand was the defendant in precisely this type of case. In *Huynh v. Ingersoll-Rand*, 20 Cal. Rptr. 2d 293 (Cal. Ct. App. 1993), the court held Ingersoll Rand liable for failing to adequately warn when the wrong disc was affixed to an Ingersoll Rand pneumatic grinder, causing it to explode, stating: "[a] clearer warning may have alerted the employee who assembled these two elements that they formed a dangerous combination . . ." *Id.* at 300-01.

Petitioners' own authorities do not support petitioners' position, but instead demonstrate that tort law recognizes a manufacturer's duty to warn as to defective components foreseeably used with its product. In *Reynolds v. Bridgestone/Firestone*, 989 F.2d 465 (11th Cir. 1993), Pet. Br. 13, the court held that tire rim manufacturer Firestone was liable for the injuries caused by an exploding tire manufactured by Goodyear, because it was foreseeable to Firestone that there would be a mismatch as between the tires used on its multi-piece rim system. The court affirmed the same principle of law adopted by the Third Circuit below: "If a manufacturer placed goods on the market that are imminently dangerous when put to their intended purpose and the manufacturer knows or reasonably should know that the goods can create danger when used in their customary manner, the manufacturer must exercise reasonable diligence to make such danger known to the persons likely to be injured by the product." *Id.* at 471; *see also Baughman v. General Motors Corp.*, 780 F.2d 1131, 1132-33 (4th Cir. 1986) (noting "a manufacturer can be fairly charged with testing and warning of dangers associated with components it decides to incorporate into its own product" but finding no liability because the replacement rim deviated from the car manufacturer's specifications). These cases support application of the Third Circuit's rule under the facts of this case.

Likewise, *Stark v. Armstrong World Indus.*, 21 F. App'x 371, 381 (6th Cir. 2001), Pet.Br. 14, held that a design defect claim against a boiler manufacturer, like Foster Wheeler, was cognizable "if the defective attachments manufactured by others were part of the boiler design and were rendered unsafe due to the design." *Id.* The reason that *Stark* held that the plaintiff could not recover was

that, unlike in this case, the plaintiff made no showing that the insulation at issue was part of the boiler's design. *Id.*

Finally, petitioners cite cases in which the manufacturer did not intend to integrate a dangerous component into its product. These cases have no relevance to this case. Pet. Br. 19 (citing *Brown v. Drake-Willock Intern, Ltd.*, 209 Mich. App. 136 (1995) (Plaintiff injured by formaldehyde in dialysis machines did not allege that "the dialysis machines themselves were defective or dangerous," and use of formaldehyde was not necessary for the safe operation of the dialysis machines)).

Petitioners negligently failed to warn that the foreseeable, indeed the expected and intended, use of their product would subject the user to danger. Petitioners' "argument depends quite heavily on the assumption that a component part . . . should be separated from the product sold." *May*, 446 Md. at 10. But the products at issue are petitioners' own machines that contained and were intended to be used with asbestos components in order to function. This is not just foreseeability; it is inevitability.

C. Whether a harm is a foreseeable consequence of one's actions is the foundation of this Court's negligence jurisprudence.

Foreseeability has been integral to this Court's negligence jurisprudence for over 100 years. *See e.g. Smith v. Bolles*, 132 U.S. 125, 130 (1889) ("The 'test is' . . . 'that those results are proximate which the wrong-doer, from his position, ***must have contemplated*** as the probable consequence of his fraud of breach of contract." (emphasis added)).

Contrary to petitioners' claim that "a foreseeability-based test for liability would prove unworkable," Pet.Br. 14, this Court has repeatedly used a foreseeability analysis across a wide spectrum of cases, largely operating to limit, rather than expand, liability. *See Husted v. A. Philip Randolph Inst.*, No. 16-980, 2018 WL 2767661, at *8 (U.S. June 11, 2018) (Alito, J., writing for the majority) (citing *Paroline v. U.S.*, 572 U.S. 434, 444-45 (2014)) ("If a registrant, having failed to send back a return card, also fails to vote during the period covering the next two general federal elections, removal is the direct, foreseeable, and closely connected consequence.").

Consistent with the Third Circuit's opinion, this Court has long established that foreseeability applies not only to duty, but also to the concept of proximate cause. *See Sofec, Inc.*, 517 U.S. at 838-39 (citing Restatement (Third) of Torts: Liability for Physical and Emotional Harm § 29 ("The concept of proximate causation is applicable in both criminal and tort law, and the analysis is parallel in many instances . . . Proximate cause is often explicated in terms of foreseeability or the scope of the risk created by the predicate conduct.")); *Lexmark Int'l, Inc. v. Static Control Components, Inc.*, 572 U.S. 118, 133 (2014) ("The proximate-cause inquiry is not easy to define, and over the years it has taken various forms; but courts have a great deal of experience applying it, and there is a wealth of precedent for them to draw upon in doing so."); *Bridge v. Phoenix Bond & Indem. Co.*, 553 U.S. 639, 656 (2008) ("If one's fault happens to concur with something extraordinary, and therefore not likely to be foreseen, he will not be answerable for such unexpected result."). Indeed, in *CSX Transp., Inc. v. McBride*, 564 U.S. 685, 718 (2011), the dissent took

the majority to task for *not* requiring a foreseeability component in Jones Act causation analysis. *Id.* (Roberts, CJ, dissenting) (noting that for the majority "it does not matter that the 'manner in which [the injury] occurred was not ... foreseeable,' *ante*, at 703 (internal quotation marks omitted), so long as some negligence —any negligence at all — can be established.").

Finally, both the Second and Third Restatements incorporate foreseeability into their negligence analysis. *See* Restatement (Third) of Torts: Prod. Liab. § 2(c) (1998) (noting that a product is defective if "the foreseeable risks of harm posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings by the seller or other distributor, or a predecessor in the commercial chain of distribution, and the omission of the instructions or warnings renders the product not reasonably safe"); *see also* Restatement (Second) of Torts § 388 (1965) (a manufacturer of a product has a duty to warn if the manufacturer "knows or has reason to know" the product is "likely to be dangerous for the use for which it is supplied . . ."). To claim that foreseeability is not part of tort law or is an "unworkable" concept is demonstrably wrong.

D. Petitioners are not innocent manufacturers of innocuous components parts.

Petitioners attempt to co-opt the law on innocent components to support their argument that no manufacturer is liable for another's parts. Pet.Br. 13. Petitioners' authorities support the principle that a manufacturer of a non-defective component part later integrated into a defective product by another is not liable

for dangers of the completed product. Pet.Br. 19 (citing *Acoba v. General Tire, Inc.* 986 P.2d 288, 305 (Haw. 1999) ("Acoba submitted no evidence to show that the tire or the inner tube failed during the accident or created the alleged defect in the rim assembly that caused it to explode.")); *see also Childress v. Gresen Manu.* Co., 888 F.2d 45, 49 (6th Cir. 1989) ("[U]nder Michigan law a component part supplier has no duty, independent of the completed product manufacturer, to analyze the design of the completed product which incorporates the nondefective component part").

But petitioners are not "innocent" manufacturers of harmless component parts incorporated into dangerous finished products. Petitioners manufactured the integrated finished product, which included everything necessary for the operation of the machine, including the requisite asbestos components, and the maintenance manual. The component part doctrine, which applies to the manufacturer of a non-dangerous component that is later integrated into a finished product, is not applicable to this case.

V. Petitioners are the parties best positioned to avoid the loss.

Courts have recognized that the scope of a legal duty is essentially a matter of policy. *See In re N.Y.C. Asbestos Litig.*, 59 N.E.3d at 469 (listing various policy-based factors used to determine whether a duty exists in a particular situation, including "the most reasonable allocation of risks, [the] burdens and costs among the parties and within society, ... economic impact, ... the person [ ] best positioned to avoid the harm[,] ... the

public policy served by the presence or absence of a duty and the logical basis of a duty."); *May*, 129 A.3d at 994 (noting that "[a]t its core, the determination of whether a duty exists represents a policy question of whether the specific plaintiff is entitled to protection from the acts of the defendant." (quoting *Gourdine v. Crews*, 955 A.2d 769, 783 (Md. 2008))).

The assumptions underlying the proposition that a manufacturer cannot control the risks associated with every product that might foreseeably be used in conjunction with their own products, Pet.Br. 14, are fully addressed by applying the Third Circuit's test. That test requires that (i) the defendant knew or should have known that asbestos is hazardous; and (ii) the defendant "specified" the use of asbestos-containing replacement components, or that such components were "essential to the proper functioning" of the defendant's product. Pet.App. 15a-16a. A manufacturer cannot claim a lack of control over the risks associated with the components required to make its machine function, because under these circumstances, those parts form the machine and it is the machine, as the sum of its parts, that inevitably causes the hazard. Petitioners "specified" the use of asbestos-containing parts, and those parts were "essential to the proper functioning" of petitioners' own products. *Quirin*, 17 F. Supp. 3d at 769, 771.

The Third Circuit's "requirements serve to limit a manufacturer's liability to cases where the harm arises from risks that are effectively incorporated into the manufacturer's product, though they may be borne by a replacement component." *Chesher*, 234 F. Supp. 3d at 709-10; *see also May*, 129 A.3d at 999 ("The necessary

replacement of asbestos components with identical components cannot be said to constitute a substantial modification.").

This middle-road approach is economically sound because "the manufacturer of the finished product containing asbestos may well be better placed to warn when compared to the manufacturer of an aftermarket wear item." *Bell*, 2016 WL 5780104, at *8. When the manufacturer incorporates the parts into its integrated product, the manufacturer is in a better position to control for the risk of harm from its integrated product than the part manufacturer. *See Bell*, 2016 WL 5780104, at *7 n.16. This is because "the end user is more likely to interact with the durable product over an extended period of time, and hence he or she is more likely to inspect warnings on that item or in associated documentation than to review warnings supplied by the maker of the 'wear item.'" *In re N.Y.C. Asbestos Litig.*, 59 N.E.3d at 472. This is particularly true in the context of machinery sold to the Navy because the manufacturer is required to provide a maintenance manual.

Additionally, the manufacturer also derives a benefit from the sale of such parts, "as the manufacturer is able to sell its own product to users precisely because the third party has sold to those users another item that is essential to the product's function." *In re N.Y.C. Asbestos Litig.*, 59 N.E.3d at 472. "Allowing equipment manufacturers to reap profits conditioned on the proliferation of asbestos-containing replacement components, while immunizing them from liability relating to such components, creates an incentive structure that fails to account for the costs such manufacturers impose on society." *Chesher*, 234 F.

Supp. 3d at 710; *In re N.Y.C. Asbestos Litig.*, 59 N.E.3d at 473 ("'[T]oday as never before the product in the hands of the consumer is often a most sophisticated and even mysterious article,' and given the practical inability of the users of modern products to detect the dangers inherent in their operation, 'from the standpoint of justice ..., responsibility should be laid on the manufacturer.'" (quoting *Codling v. Paglia*, 298 N.E.2d 622, 627 (N.Y. 1973))).

Petitioners sold their machines to the Navy and to civilian consumers containing and requiring the same asbestos components, and petitioners purchased insurance to defray the cost of liability for harms arising from their products. The cost of that insurance coverage was recouped by the manufacturers in the purchase prices for their products. The cost to insurers for the current liabilities was paid – in advance – in the form of premiums that the insurers retained for decades before having to pay on the risks they agreed to underwrite.

This is *precisely* the allocation of risk that tort law is structured to achieve. Absolving petitioners will give a windfall to them and their insurers at the expense of the public as a result of (i) premium costs that were passed on to the Navy, (ii) unrecouped Medicare and VA medical costs, and (iii) potential contractual indemnity costs owed by the Navy to shipbuilders who are saddled with a higher share of the liability with no opportunity to obtain contribution or indemnity from petitioners and those similarly situated.

VI. The government contractor defense is not at issue.

Petitioners' contention that the Navy would not allow them to warn has no relevance to the question presented. Specifically, the government contractor defense is not before this Court. *See Boyle v. United Technologies Corp.*, 487 U.S. 500 (1988). Both the district court and the Third Circuit declined to rule upon the government contractor defense, and petitioners did not present the defense for *certiorari*. Only petitioners CBS, Foster Wheeler and Respondent GE raised this defense. The district court specifically did not address it with regard to any defendant. Pet.App. 70a CBS; Pet.App. 78a Foster Wheeler; JA 780 GE. And the Third Circuit specifically declined to address it as well, leaving it to the district court to decide on remand. Pet.App. 16a-17a. This defense, therefore, will be available to petitioners, even if this Court rejects their instant request for blanket immunity based on the "bare metal" defense.

Moreover, petitioners' requested rule expressly applies to all maritime cases including private shipyard workers, merchant mariners, commercial fishers, and any other person in a maritime trade to whom a maritime negligence claim may apply. Petitioners do not request, nor would maritime law's desire for uniformity allow a "Navy-only" rule. In those non-Navy cases, the Navy's knowledge, conduct and alleged position on warnings does not apply.

Finally, the "facts" presented by petitioners for their "Government made me do it" defense are, at best, a battle of the experts. *In re Joint E. and S. Dist. N.Y. Asbestos Litig.*, 897 F.2d 626, 632 (2d Cir. 1990). In their

statement of the case, petitioners cite to the affidavits of their expert witnesses—Adm. Horne, JA 22-89, Dr. Betts, JA 90-223, and Mr. Senter JA 224-258—as though each was unrebutted. However, respondents' experts—Messrs. Faherty, JA 480-485; 585-592, and Castleman, JA 459-462, Dr. Frank, JA 596-744, and Capt. Woodruff Resp.App.E 26a-138a—dispute both the factual bases and the conclusions that petitioners' experts advocate. Neither side filed a motion challenging the qualifications or methodology of these experts. Where there is a material dispute among qualified experts concerning this issue, it is inappropriate for the trial court to grant summary judgment.

VII. The Third Circuit applied the correct rule, and properly remanded for further factual determinations.

As demonstrated above, the Third Circuit's standard accords with this Court's maritime precedent, settled maritime principles of uniformity, simplicity and solicitude, and the prevailing law of the land. This "expected and intended" or "inevitability" test is simple to apply and is consistent with those principles this Court has used across a wide range of causes of action in order to ascribe, or in most cases to limit, liability.

If this Court adopts petitioners' unprecedented rule of blanket immunity and rejects the uniform maritime duty of reasonable care under the circumstances of each case, this outlier holding would contradict countless of this Court's opinions upon which lower courts rely daily. Further, if this Court rejects the use of foreseeability in negligence, it will overturn decades of tort and maritime negligence

law applying foreseeability to analyze proximate cause, superseding cause, and the scope of a duty.

Applying the Third Circuit's test and this Court's summary judgment standard, *see Anderson*, 477 U.S. at 255, there is substantial record evidence that petitioners violated their duty to warn because they (i) knew asbestos is hazardous; (ii) knew their products would be used with asbestos-containing parts; (iii) directed users to perform tasks that would create asbestos dust, and (iv) failed to warn of this known danger. The Third Circuit properly left to the factfinder the resolution of the disputes of fact between the parties and the ultimate question of whether petitioners' actions were negligent and a contributing cause to respondents' cancers. Respondents request that this Court affirm.

CONCLUSION

For the reasons stated above, this Court should affirm.

Respectfully submitted,

JONATHAN RUCKDESCHEL
THE RUCKDESCHEL LAW FIRM, LLC
8357 Main Street
Ellicott City, MD 21043
(410) 750-7825
ruck@rucklawfirm.com

WILLIAM W.C. HARTY
PATTEN, WORNOM, HATTEN & DIAMONSTEIN
12350 Jefferson Avenue, Suite 300
Newport News, VA 23602
(757) 223-4500
wharty@pwhd.com

RICHARD P. MYERS
Counsel of Record
ROBERT E. PAUL
ALAN I. REICH
PATRICK J. MYERS
PAUL, REICH & MYERS, P.C.
1608 Walnut Street, Suite 500
Philadelphia, PA 19103
(215) 735-9200
rmyers@prmpclaw.com

DENYSE F. CLANCY
KAZAN, MCCLAIN, SATTERLEY & GREENWOOD
55 Harrison Street, Suite 400
Oakland, CA 94607
(877) 995-6372
dclancy@kazanlaw.com

Counsel for Respondents

APPENDIX

APPENDIX A — *DeVries, et ux. v. General Electric Co., et al.*, No. 13-cv-474 (E.D. Pa.) (Doc. 269-3, Pages 28, 38-39, 43, 58-59, 60-62) (Motion for Summary Judgment of CBS Corp.) (Plaintiff's Discovery Deposition, Pages 324, 350-351, 358, 397-398, 403-405)

COURT OF COMMON PLEAS
PHILADELPHIA COUNTY

NO. 3661
ASBESTOS CASE

JOHN B. DEVRIES AND ROBERTA G. DEVRIES,

Plaintiffs,

vs.

ALLEN-BRADLEY COMPANY, *et al.*,

Defendants.

WEDNESDAY, JANUARY 16, 2013

VIDEOTAPED DISCOVERY

Deposition of JOHN B. DeVRIES, taken pursuant to notice, held at the offices of Veritext National Court Reporting Company, 1801 Market Street, Suite 1800, Philadelphia, Pennsylvania on the above date, beginning at or about 10:15 a.m., before Kathleen Woods Logue, Professional Reporter and Notary Public there being present.

Appendix A

VERITEXT NATIONAL COURT
REPORTING COMPANY
MID-ATLANTIC REGION
1801 Market Street - Suite 1800
Philadelphia, Pennsylvania 19103

* * *

[324]Q. And who, that's between ship crew or yard birds or others, ripped out the insulation?

A. We're talking about a time period --

Q. In the first three months.

A. Before the ship went to the yard?

Q. Correct.

A. It had to be ship's personnel.

Q. Okay. Do you know -- do you recall which ship's personnel they were at this point?

A. No.

Q. And were they under your command at this point yet?

A. They were.

Q. They were. As the main propulsion assistant they were under your command; is that correct?

A. That is correct.

* * *

[350]Q. And as to the content of those blankets, do you know what it was?

A. No.

Q. And as to who manufactured those blankets, do you know who manufactured them? Did they have any label or name on the blankets themselves?

A. No.

Q. Now, with respect to various signs and warnings or indicators around the ship, I understand there were -- the Navy used certain indicators as to types of pipes or types of equipment; correct? There were painted markings on some things?

A. Some were marked.

Q. Okay. Do you know who as between the Navy and the manufacturers determined what markings would be on such pieces of machinery or equipment?

A. Some equipment manuals from manufacturers as General Electric specified the marking.

Q. Well, were these operational markings?

A. I do not recollect the words used or [351]symbols used.

Q. Did you ever run into a contradiction as the engineering officer on the ship or otherwise between something stated in the manufacturer's manual and something stated in a Navy document?

A. The manufacturer's manuals came to me most often as a Navy document.

Q. Oh, I see. And with respect to how they were reviewed by the Navy before they got to you, I take it you do not personally have knowledge?

A. I do not know.

Q. Now, when you were on the ship, you said earlier it was at sea and it went to various places such as the Mediterranean; correct?

A. Yes.

Q. And during the time it was in dry dock I understand is that one of those dry docks which is not far from the water on a Navy base? Is that correct?

A. When I mentioned dry dock at Davisville, Rhode Island it was a floating dry dock, really what was a Seabee --

* * *

[358]did, I take it you directed them to follow the procedures in accord, as you have said many times,

with the combination of what was in the manufacturers' manuals or what the Navy had trained you to do; correct?

A. Yes.

Q. And is it your understanding that the workers doing that job were required to do what you as the Naval officer told them to do?

A. Yes.

Q. And with respect to masks, respirators or dust protection, did you give any special orders during that Monte Carlo repair?

A. No.

Q. Did you see any contradiction at any -- you have already told me that. I'm not going to go back there.

Now, were there any further repairs to disturb the insulation on the turbine after that Monte Carlo incident and before you left the USS TURNER that you recall?

A. Yes.

* * *

[397]So whether it be the pump end or the turbine end or turbine motor end, whatever, I view the unit -- view this as a unit.

BY MR. REICH:

Q. Okay. And was that unit insulated?

MR. KATTNER: Object to form.

THE WITNESS: Turbines were insulated, the pump when it was handling a hot media, insulated, yes.

BY MR. REICH:

Q. Okay. And was it necessary to disturb or remove any of the insulation on the Westinghouse turbines that were attached to those pumps?

A. In most cases it would have to have been.

Q. Did that make dust?

A. Any time you remove insulation, or at least in my experience on the TURNER, any time insulation was disturbed you got dust.

Q. And did you breathe that dust?

A. And if you were close to it and [398]unfortunately I knew no better I was close to it all the time either instructing somebody or looking, inspecting for myself.

Q. So specifically when removing or handling the insulation on the Westinghouse turbines attached to these pumps did that give off dust that you breathed?

A. Removal of insulation on the pump turbine would have given off -- did give off dust and I would have breathed it.

Q. Okay. Were there any warning labels on any of the General Electric equipment as to the dangers of asbestos?

MR. KATTNER: Objection to form.

THE WITNESS: None.

BY MR. REICH:

Q. Were there any warning labels on the Westinghouse equipment on the TURNER with regard to the dangers of asbestos?

A. None.

* * *

[403]Q. Okay. Was there any dust from that particular phenolic part when these motors were opened up that you recall?

A. I remember dust.

Q. But whether it came from the phenolic or some other source do you know?

A. I cannot be certain.

Q. Okay. And the operations that you observed with respect to the opening up of the motors did they generate dust from that phenolic specifically?

A. The physical opening did not generate dust. It may have allowed dust that was inside the motor to escape.

Q. But as to the source of that dust from the phenolic or some other place you don't know?

A. No.

Q. Now, as to the insulation on the outside of the ship service turbine generator or these various drive turbines for the different pumps that you were just describing was that insulation this same type of external insulation that was elsewhere on the TURNER [404]with machinery that you had described earlier, the so-called mud or was it different?

A. Some of the equipment may have had blanket type insulation, some was mud, some --

Q. Got you.

A. -- some was mud combined.

Q. And as to the manufacturer of those various blankets on some of the equipment, whether it was the drive turbines or the pump turbines or the SSTG turbine, or whatever it was, do you know who had manufactured those blankets?

MR. REICH: He's already testified at least a half dozen times --

BY MR. KATTNER:

Q. You don't know. He doesn't know who manufactured the blankets originally or whether they were replaced, do you?

MR. REICH: He has testified to that already.

MR. KATTNER: Got you.

BY MR. KATTNER:

Q. And the same thing as to who manufactured any of the mud or the external [405]insulation on any of these drive turbines, you don't know, do you?

MR. REICH: And I object.

He's already answered that a number of times.

BY MR. KATTNER:

Q. And you have no information that General Electric supplied any of the external insulation on any of these turbines, do you, you yourself?

A. I have no personal information.

Q. And the same thing, you have no knowledge that Westinghouse supplied any of that insulation?

A. I have no personal information to say Westinghouse supplied it.

* * * *

APPENDIX B — *DeVries, et ux. v. General Electric Co., et al.*, No. 13-cv-474 (E.D. Pa.) (Doc. 270-3, Pages 6, 56-58) (Motion for Summary Judgment of General Electric Company) (Plaintiff's Discovery Deposition, Pages 79; 386-388)

* * *

[79]Q. And what do you mean when you say the leads?

A. I said all of these.

Q. All of these. I'm sorry. Do you recall any work being performed in your vicinity on any of the turbines?

A. Yes.

Q. And what work was performed on the turbines in your vicinity?

A. I can't answer what was done when, but the turbines were opened up to check thrust bearings. They were opened up to check the -- actually not the turbines, but the reduction gears were opened up to check the gears. And in at least one case I very -- I can remember very well we had to replace a part.

Q. Do you recall what part was replaced on the turbine?

A. I don't recall the part, but we were in Monte Carlo at holiday time and I couldn't leave the ship when the turbine was opened. The part was replaced by having a cruiser, I believe, up the coast machine a new part for us.

Appendix B

* * *

[386]Q. -- on them?

A. They were insulated.

Q. What's the purpose of insulation on the main propulsion turbines?

A. Well, a turbine converts heat energy into movement and you -- superheated steam, 600 pound pressure steam is at the entry point. You don't want to lose any heat. And of course you don't want -- you don't want anybody to get burned.

Q. So there were really two purposes, one for safety, people not touching it and getting burned; is that correct?

A. One is safety and one is efficiency of the operation.

Q. Now, with regard to the ship's service generator, do you recall what company manufactured that?

A. I believe it was General -- it was General Electric.

Q. Okay. And do you remember whether there was any asbestos on the ship's service generator, if you recall?

A. Normal insulating material, electrical [387]insulating materials.

Q. Okay. Was it --

A. Also, I believe there were thermal insulation on the turbine end.

Q. How many of the ship's service generators would there have been on the TURNER or were there on the TURNER?

A. I believe one in each engine room.

Q. And do you recall having to either work or supervise the work on either of those while you were on the TURNER?

A. We made repairs on both of them.

Q. And in making those repairs, was it required to remove or disturb any of the insulation that was on the outside of it?

A. Yes.

Q. Did that create dust?

A. Yes.

Q. Did you breathe the dust?

A. I was right on top of it.

Q. Okay. How frequently would those items need repair in the three years that you were on the ship, if you can recall?

A. I can't recall.

[388]Q. Was it often? Frequent? How would you describe it?

A. Moderately frequent.

Q. Okay. Now, was there also an emergency diesel -- let me just see here.

MR. KATTNER: You can show him the exhibit. I mean --

MR. REICH: No. That's okay.

BY MR. REICH:

Q. An emergency diesel generator on the ship?

A. The ship had an emergency diesel generator.

Q. What was the purpose of that piece of equipment?

A. Backup power.

Q. Power for the ship or for propulsion?

A. Backup electric power.

Q. Okay. And do you know whether that -- strike that. How many would there have been on the ship? Do you recall?

A. I recall one.

Q. And that was manufactured by?

A. By General Electric.

* * * *

APPENDIX C — *DeVries, et ux. v. General Electric Co., et al.*, No. 13-cv-474 (E.D. Pa.) (Doc. 274, Pages 18-19, 21, 26, 28, 38) (Motion for Summary Judgment of Buffalo Pumps, Inc.) (Plaintiff's Discovery Deposition, Pages 70-71; 90; 101; 112; 235)

* * *

[70]Q. And what type of work is being performed in the engineering compartments?

A. First of all, the engine rooms get steam from the boiler rooms to turn turbines that turn the ships through. There are a myriad of pumps and auxiliaries that have to be repaired, maintained, work -- that meant that I spent a lot of time with the people who were trying to maintain this equipment.

Q. Now, you mentioned boilers. Were the boilers located in a separate room in the engine rooms?

A. There were two boiler rooms, two boilers in each room.

Q. Did your duties ever take you to the boiler room?

A. Yes.

Q. You also mentioned turbines. Where were the turbines located?

A. They were in the engine room.

Q. Where would the pumps be located?

A. All through the spaces.

Q. Do you recall any other equipment on which repair or maintenance work was performed [71]other than boilers, turbines and pumps?

A. Electrical equipment.

Q. What type of electrical equipment?

A. Generators and switchboards.

Q. Aside from boilers, turbines, pumps, generators and switchboards, do you recall any other equipment on which maintenance or repair work was performed?

A. In that ship and all ships at that time the Engineering Department maintained everything that operated except the electronics and the armaments. That would include things like standby diesel generators.

Q. Now, when you say except electronics and armaments, you mentioned diesel generators, is it your testimony that it was not your job to oversee the maintenance and repair work on the diesel generators?

A. No. Correct that. We were responsible for everything including the diesel generator which I mentioned only because they were not in the engine rooms.

* * *

[90]Q. You'd have pumps for waste lines as well; is that correct?

A. Yes.

Q. Do you recall any work that was performed in your vicinity on any of the pumps aboard the USS TURNER?

A. Yes.

Q. What type of work was performed in your vicinity on the pumps?

A. We were constantly putting new stuffing in the stuffing boxes.

Q. Do you recall any other work aside from putting the stuffing in the stuffing boxes on the pumps?

A. Yes. Yes.

Q. Okay. And what type of work?

A. Well, if a pump had to be removed, then the flanges had to be cleaned and sealed.

Q. Now, you just mentioned flanges in relation to pumps. Do you recall if any of those pumps did not have flanges?

A. I do not recall.

* * *

[101]Q. And where would these seals be located?

A. Well, between the -- when I say pump, I mean the pump, centrifugal pump or otherwise as what I'll call wet end and then it has a driver, normally an electric motor and the shaft would have a seal.

Q. Did you ever --

A. I should call it packing more, but anyway --

Q. Okay. So is this the same packing that we have talked about when we said stuffing?

A. Stuffing, packing.

Q. Okay. What term would you rather use, stuffing or packing?

A. Packing would be the more correct term.

Q. Okay. So when we were talking about stuffing before we were talking about packing material; correct?

A. Yeah.

Q. Did this packing material, the innards of the pump did that differ at all from the packing you had talked about earlier?

A. I can't recollect at this time. Wait a minute. The packing was different

Appendix C

* * *

[112]Q. I've heard people say that when rip-outs are performed it's similar to -- it creates a situation where it looks like it's snowing. Would you describe it that way?

A. Well, I would suggest that when you removed, say, a pump for maintenance, removing of the insulation, assuming this was an insulated pump, would create a cloud and so you would have clouds of dust.

Q. Now, you didn't mention insulation in relation to the pumps earlier. Was there insulation on any of the pumps?

A. Oh, sure.

Q. Would it be safe to say that not all the pumps were insulated?

A. A cold water service pump doesn't need to be insulated.

* * *

[235]BY MR. WEINBERG:

Q. All right. Sitting here today, do you have a specific recollection of ever being in the vicinity when a Buffalo pump was being worked upon?

A. I don't have a specific pump or specific date. But we worked on so many pumps, everybody's pumps. And the answers given previously would apply to any of the major

pump suppliers that we had. We had the constant packing problem. And, yes, you hit on some of it. I think things got out of alignment as you heard me say earlier. Some of the mounting framing was corroded and gone, so we had a constant repacking and repair.

APPENDIX D — *DeVries, et ux. v. General Electric Co., et al.*, No. 13-cv-474 (E.D. Pa.) (Doc. 277-1, Pages 11, 13, 20) (Motion for Summary Judgment of Foster Wheeler LLC) (Plaintiff's Discovery Deposition, Pages 268-269, 274-275, 425-427)

* * *

[268]BY MR. MASTROIANNI:

Q. So you guys didn't do the repair so to speak?

A. We're not equipped to.

Q. You just more or less did damage control and waited until you docked for overhaul work to fully address the extent of the problems; correct?

A. Yes.

Q. And was this the overhaul -- was this the second overhaul that you talked about or was this another overhaul?

A. Well, this would -- this would have been [269]the second overhaul.

Q. Okay.

A. Which you may have record of as FRAM, fleet rehabilitation and maintenance.

Q. I'm sorry. What year was that second overhaul again?

A. Well, that would be 1960. That was done in Brooklyn.

Q. Okay. And by that time you were out of the Navy?

A. Well, as in Boston I was around for the rip-out, but more I was involved very much in planning what would be done.

Q. Are you talking about what would be done to the condenser?

A. Work orders for the whole project, not just --

Q. The whole overhaul project?

A. Yeah.

Q. Okay. So you essentially, and correct me if I'm wrong, while the ship was out at sea made a list of things that needed to be addressed once the ship was dry docked for overhaul and maybe even ranked them in order.

* * *

[274]Q. Okay. Other than this contaminated water issue with respect to the one condenser, do you recall any other type of work that you or your crew would have done on a Foster Wheeler condenser on board the TURNER?

A. Restate that, please.

Q. Other than the contaminated salt water issue that you had --

A. Yes.

Appendix D

Q. -- that we've been talking about, do you recall any other work, maintenance, repair or otherwise that you would have done on a Foster Wheeler condenser?

A. I don't recollect.

Q. You talked about going in the header yourself. Was that the extent of any kind of hands-on work that you did with respect to the contaminated salt water problem or did you do other types of hands-on work for that?

A. Hands-on that was it.

Q. That was it. And that I think you said was just merely looking for leaks within the [275]hundreds of tubes?

A. Looking for leaks and then plugging the ones that leaked.

MR. REICH: While he was inside of it it's hard to say merely.

MR. MASTROIANNI: Oh, okay. I think of a Beluga whale.

THE WITNESS: These are big.

BY MR. MASTROIANNI:

Q. What did you plug the leaks with?

A. I recollect wooden plugs a supply of which we kept for such an event.

Q. Were these like wooden blocks or --

MR. REICH: It's a plug.

THE WITNESS: Tapered machined wood.

[425]In response to questions by your attorney you mentioned there were connections or pipes that led up to the condensers; is that correct?

A. To and from.

Q. To and from. Okay. And any flange work that we talked about yesterday was with respect to the flanges on those connections; correct?

A. Yes.

Q. Okay. How many of those connections were there leading to and from the condensers?

A. I don't recollect the configurations.

Q. So you can't tell me how many connections there were?

A. No.

Q. Okay. Were these connections -- is it correct that they were going either back to the boiler or from the turbine? Is that what these connections were for to essentially connect the condensers to the boiler and turbine?

A. Yes. Essentially the condenser was [426]taking the last bit of heat out of the steam --

Q. Right.

A. -- converting to water as you understand.

Q. So there's at least two of these pipes or connections?

A. There's at least two.

Q. Okay. Do you remember there being any more than, I don't know, five?

A. I don't remember more.

Q. Now, you did discuss yesterday being on top of someone who was doing the removal of the seal or gasket on the flanges to these connectors; correct?

A. Yes.

Q. Okay. Were you -- well, let me back up. That work, was that performed in connection with that damage control work we discussed yesterday in relation to --

A. No.

Q. -- the salt water contamination?

A. No. No.

Q. It wasn't. Okay.

[427]A. No.

Q. Are you able to tell me either by estimating or approximating the number of times you would have been in the vicinity of someone removing a flange from a connection to a Foster Wheeler connection -- condenser?

A. These connections were not broken except when the vessel was in port or in the yard.

Q. Okay.

A. Not frequently.

Q. Okay. Are you able to tell me either by estimating or approximating how long it took for someone to remove a seal or gasket from one of these flanges?

A. I don't recollect that or how many studs there were or any way to approximate it.

Q. Okay. Would it be more than 15 minutes?

A. It could have been more than 15 minutes --

Q. Okay.

A. -- depending on the --

Q. The nature of --

A. -- the nature of the fit.

* * * *

APPENDIX E — *DeVries, et ux. v. General Electric Co., et al.*, No. 13-cv-474 (E.D. Pa.) (Doc. 291-2, Pages 34-35, Doc. 291-3, Pages 1-35) (Response to Motion for Summary Judgment of Foster Wheeler, LLC) (Affidavit of Captain Bruce Woodruff, Pages 1-38)

COURT OF COMMON PLEAS
PHILADELPHIA COUNTY

NO. 3661

ASBESTOS CASE

DECEMBER TERM 2012

JOHN B. DEVRIES AND
ROBERTA G. DEVRIES, H/W,

Plaintiffs,

v.

ALLEN-BRADLEY COMPANY, *et al.*,

Defendants.

**AFFIDAVIT OF CAPT. R. BRUCE WOODRUFF
U.S. NAVY (RET)**

JUNE 2013

I, Robert Bruce Woodruff, declare and state the following:

1. Qualifications. My name is R. Bruce Woodruff. As a Naval Architect and Marine Engineer through

education, experience, and training, I am an expert in the design, construction, operation, inspection, repair, and maintenance of Naval vessels and commercial ships. A specific subspecialty is marine engineering propulsion systems for U.S. Navy ships, including ships powered by steam propulsion, diesel, and gas turbines. Additionally, I am an expert in shipyard processes, which includes the manufacturing, construction, repair, testing, and trials of ships in both commercial and Naval shipyards.

Currently President of the Richmond Consulting Group (RCG), Richmond, VA, I retired from the U.S. Navy as an Engineering Duty Officer and held three major command positions with rank as Captain. My Curriculum vitae is attached as Exhibit (1) and is incorporated by reference herein. I hold the Bachelor of Science degree from the U.S. Naval Academy, Annapolis, MD, where I graduated 'With Distinction' and hold two graduate degrees from the Massachusetts Institute of Technology, Cambridge, MA. The degrees are Ocean Engineer[1] (Naval Architecture and Marine Engineering) and a Master of Science in Mechanical Engineering. My thesis was the design of a combined steam and gas turbine power plant for a Navy class of combatant ships. I attended the Darden Business School Executive Program at the University of Virginia in Charlottesville, VA.

While on active duty, I completed the one-year senior

1. The **Engineer Degree** at MIT requires broader competence in engineering and science than the Master's Degree; the thesis requires less emphasis on original research than a Doctoral Program. The Engineer Degree is not commonly awarded at U.S. universities with engineering programs.

staff Industrial College of the Armed Forces at the Washington DC National Defense University, the U.S. Naval Destroyer Engineering School in Newport, RI, the Nuclear Ship Superintendent's Course at the Puget Sound Naval Shipyard, and the U.S. Navy Boiler School at the Philadelphia Naval Shipyard.[2] My afloat experience was on three Navy steam ships with qualifications as Engineer Officer (Chief Engineer), Main Propulsion Assistant, Fleet Officer of the Deck, Engineering Officer of the Watch, and Destroyer Tender Repair Officer.

I have been formally certified as a U.S. Navy Fleet Boiler Inspector by the Naval Boiler & Turbine Laboratory in Philadelphia. I have performed numerous calculations, inspections, tests and engineering studies on various classes of ships related to U.S. Navy Combatant ship design, shipyard production processes, marine engineering and power generation, as well as auxiliary systems, including pumps, piping and valves.

In 29 years of Navy active duty, my tours included more than 24 years responsible for the design, construction and maintenance of a wide range of naval combatants

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2. **Destroyer School** was a detailed course on the design and operation of the DD 692/710 Gearing/Sumner Class destroyers. It required on board ship system tracing/drawing for all engineering space equipment. Included were 2 weeks at sea with students operating the USS Fred T. Berry(DD 858). **Nuclear Ship Superintendent School** included the design and operation of nuclear submarine plants Westinghouse S5W. Included actual onboard nuclear refueling of an SSN 637 Class submarine in process at the yard and as well reactor physics and Navy radiological control (RADCON) processes.

e.g., aircraft carriers, cruisers and destroyers, support ships, and other watercraft. As a U.S. Navy Captain and Supervisor of Shipbuilding (Supship), Pascagoula, Mississippi (co-located with Ingalls Shipbuilding Division of Litton Industries), I oversaw shipyard contracts for both the construction and overhaul/repair of Navy/Army/NOAA ships in Mississippi, Alabama and Florida. The primary products of the Ingalls Shipyard were the CG 47 Class Aegis Cruisers, DDG 51 Class Aegis Destroyers, and the aircraft capable Amphibious Assault Ships, LHD-1 class.

Prior to that, my tour was as the Navy's Program Manager at the Naval Sea Systems Command (Navsea) for both the CG-47 Class of Aegis Guided Missile Cruisers and the FFG-7 Class of Guided Missile Frigates. My two shipyard tours included Norfolk Naval Shipyard, Portsmouth, VA, as Production Engineer and Ship Superintendent for the aircraft carrier USS J. F. Kennedy (CV-67). In 1972, I was assigned at the Boston Naval Shipyard as a Ship Superintendent on the waterfront for repair availabilities of the steam driven destroyer USS Coontz (DLG 9) and cruiser USS Richmond K. Turner (CG 20).

Following my service as a senior Naval Officer, I was Vice President and Division General Manager for Asea Brown Boveri (ABB), a company manufacturing and servicing large (100+megawatt) steam turbines, gas turbines and generators for the utility industry. Since 1996, I have served as the President of RCG, which provides consulting services related to ship design and operations, shipyard construction and repair processes and government contracting. This has included a wide range of clients,

including the U.S. Department of Justice, U.S. Navy, U.S. Coast Guard, Siemens Corp., Eaton Corp, Metro Machine and Drydock, Aepco Marine, L3 Corp., Friede Goldman Halter Co. (Halter Marine), KPMG Peat Marwick, Anteon Corp., General Dynamics Information Technology, and numerous national law firms. I have served as an expert witness in support of asbestos and mesothelioma litigation.

I am a member of the Society of Naval Architects and Marine Engineers, the American Society of Naval Engineers, the Society of Professional Engineers, the Virginia Ship Repair Association, and the American Society of Mechanical Engineers.

2. Discussion

This affidavit is structured to include the following:

(a) The source of information considered in forming the opinions;
(b) A statement of all opinions expressed and the basis and reasons therefore;
(c) Exhibits and source references used as primary support for the opinions;
(d) Expert qualifications and publications authored;
(e) A listing of other cases in which the expert has testified or been deposed.

(a) Source of information relied on for my opinions.

I have been retained by Paul Reich & Meyers, P.C., Philadelphia, Pennsylvania, to provide expert opinion

and testimony in the matter of asbestos exposure that Lieutenant junior grade John B. DeVries received during his Navy career. He served in the Engineering Department on the destroyer USS Turner (DDR 834) from 1957-1960. Mr. DeVries was designated as the Boiler Officer and Main Propulsion Assistant (MPA). I analyzed the duration and magnitude of exposure that Mr. De Vries would have seen due to daily contact and close proximity to asbestos insulation, gaskets, and packing on the Turner. I also address the requirement for Navy equipment suppliers to place asbestos hazardous warnings in the technical manuals and drawings that they submitted to the government for approval. Had these cautions been included in their draft technical manuals and drawings would the U.S. Navy have prohibited them or included them in the published documents?

Primary sources of information for my opinions are DeVries' testimony, my direct telephone call with Mr. DeVries, my own personal experience, and the documents listed in paragraph (c).[3] It may be necessary for me to change this opinion should facts not known be disclosed to me prior to any testimony that I might give in this matter.

(b) A statement of opinions expressed and the basis therefore.

1. Summary. Without doubt or question, Mr. DeVries received significant exposure to asbestos during his more than 1000+ days assigned to the Turner, primarily from

3. Depositions of John B. DeVries, January 15, 16, & 17, 2013.

amosite asbestos lagging and asbestos gaskets and packing in and on engineering spaces equipment and piping. That is, while serving as the Main Propulsion Assistant in the Engineering Department on board Turner, one of the primary source of exposure for DeVries was his close proximity to amosite asbestos insulation and lagging located on the piping and equipment in the ship's engine rooms. This is based on my own experience operating and maintaining steam driven ships during twenty-nine years in the U.S. Navy. My Navy career included assignment at two naval shipyards that routinely overhauled ships similar to the Turner. My own Navy career included an initial tour as Main Propulsion Assistant and I fully understand the scope and demands of this position aboard a steam driven destroyer.[4]

A major contributor to the substantial asbestos exposure came from the Turner's time in Naval shipyards one of which included a FRAM overhaul of extended duration with extensive work being accomplished in the engineering spaces.[5]

- Sept 1957-Jan 1958-Regular Overhaul, Boston Naval Shipyard--3+ months

- 14-23 January 1959-Tender Availability Alongside USS Everglades (AD 24), Genoa, Italy

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4. My experience was identical to Mr. DeVries -- I reported aboard the destroyer USS Davis (937) as Boilers Officer/MPA for my first shipboard tour.

5. FRAM stands for Fleet Rehabilitation and Modernization overhaul.

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- 13 Jan-12 Aug 1960-FRAM Overhaul, New York Naval Shipyard--7 months

Additionally, the Turner made multiple deployments to the Mediterranean Sea while DeVries was on board. I personally sailed for multiple 'Med cruises' aboard two destroyer type ships. The need for the ship to meet their operational commitments places significant demands on ship's force engineers for all steam system repairs and maintenance. Time in the Med alongside a tender or in a foreign yard for repairs was infrequent. When destroyers in the Med were in port, the engineers routinely had to stay aboard to repair pumps, valves, gaskets, packing, and damaged asbestos lagging. Responsibility for this oversight would have fallen to Mr. De Vries.

2. Asbestos on Board Navy Ships and in Shipyard Shops.

The Navy's technical requirements for the elevated steam system temperatures were clearly mandated in the specifications for the steam system equipment. Asbestos lagging, gaskets, and packing were required for the turbines, boilers, evaporators, pumps, piping, and valves. **Operational ships and shipyards of this era installing, removing, and maintaining steam systems were a constant and pervasive source of asbestos contamination.** The U.S. Navy Bureau of Ships (Buships)[6] made it quite clear that asbestos remained the insulator of choice:

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6. Bureau of Ships, U.S. Navy-the Washington, DC organization responsible for the acquisition, construction, and maintenance of all ships. It was renamed NAVSHIPS and finally became the Naval Sea Systems Command (NAVSEA).

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> *"Covers for use at temperatures of 850° Fahrenheit and* ***blow*** *shall be filled with asbestos felt. Wire inserted asbestos cloth Fed. Spec. SS-C-466, Grade C shall be used on the inside of covers"*[7]

Detailed specifications for these systems included the main and auxiliary turbines, boilers, evaporators, pumps, piping, and valves. Tailored to the machinery specifications were numerous specifications for insulation, gaskets, and packing that required asbestos. The Navy's design and construction practices and standards for thermal insulation, gaskets, and packing for machinery and piping confirm that the ships constructed from 1940 to 1980 contained mammoth quantities of asbestos. I have reviewed multiple industry and Navy letters, memos, and other documents from this era that validate that the ships of this era contained significant quantities of asbestos, primarily in the form of amosite. This research included suppliers of the machinery itself and the asbestos manufacturers. For the Navy it included Buships, operational ships, shipyards, and Supervisors of Shipbuilding (Supship).[8]

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7. General Specifications for Ships of the United States Navy, Bureau of Ships, Section S39-2, Thermal Insulation and Acoustic Absorptive Treatment for Machinery, Piping and Ducts, 1 July 1954.

8. Supervisors of Shipbuilding were Navy commands stationed at or near shipyards and Navy ports to execute and manage repair and overhaul contracts.

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Figure 1 below identifies a typical sample of the Navy specifications used in marine steam systems and lists the systems in which these asbestos products were routinely installed. Both the U.S. Navy and the U.S. Maritime Commission (merchant ships) used the same insulation requirements with very few exceptions. These numerous detailed specifications for steam and diesel driven ships date back in some cases to the 1920s and 1930s. DeVries would have seen exposure to all of these products during his career on the Turner. Most of the key DD 692/710 Class destroyer insulation specifications are listed in Figure 1.

ITEM	SPECIFIC SYSTEM EXAMPLES	ASBESTOS DRAWINGS
INS. & LAG. SCHEDULE	**MACHINERY INS. AND LAGGING REQMTS FOR ALL SHIPS USING ASBESTOS**	BUSHIPS DRAWINGS DD710-S3902-245452
MAIN BOILERS	INSULATION AND LAGGING FOR BOILER STEAM DRUM, WATER DRUMS & HEADERS	**NAVY SPEC 32C11, ASBESTOS CLOTH; N. SPEC 32F3 ASBESTOS FELT**; LAGGING DIAGRAM, BOILER BUR. OF ENG. 41-B-01357, 2/21/1933 & 41-B-01937, 11/25/1931
MAIN ENGINES	INSULATION AND LAGGING	**NAVY SPECIFICATION 32C11 ASBESTOS CLOTH; NAVY SPEC 32F3 ASBESTOS FELT**; DIAGRAM, LP/HP TURBINE, BUREAU OF ENG. 41-B-01929, 5/31/1932

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SHIP SERVICE TURBO GENS.	INSULATION AND LAGGING	**NAVY SPECIFICATION 32C11; NAVY SPEC 32F3;** DIAGRAM, 400 KW TURBOGENERATOR, BUREAU OF ENG. DWG. 41-B-01929, 7/21/1932
FLASH DIST. PLANT	EVAPORATORS -- OUTER SHELL OF EVAPORATOR LAGGED THROUGHOUT	**CLASS DESIGN INSULATION DRAWINGS:** DD692-S3902-3 DD940 S3902 H 1374090
PUMPS	MAIN FEED BOOSTER PUMPS MAIN CONDENSATE PUMPS MAIN FEED PUMPS	**CLASS DESIGN INSULATION DRAWINGS** DD692 S4602-6 DD692-S5801-16 DD692-S5801-15 DD692-S4700-444 DD692-S4631

ASBESTOS GASKETS NAVY SPEC	MAIN COND. PUMP ASSY, AUX COND. CIRC PUMP, FRESH WATER DISTRIBUTION PUMP DISTILLING CONDENSER CIRC PUMP EVAP BRINE OVERBOARD PUMP	**CLASS DESIGN INSULATION DRAWINGS** DD692-S4601-14 DD692-S4602-6 DD692-S5801-20 DD692-S5801-16 DD692-S5801-15 DD692-S4700-444 **NAVY SPEC 33P13**
ASBESTOS INSUL. MATL.	BLOCK INSULATION, EXAMPLE FIRE AND BILGE PUMP	**CLASS DESIGN INSULATION DRAWINGS** DD692-S4700-10 **NAVY SPEC 32M2**
METALLIC ASB. GASKETS.	METALLIC GASKETS FIRE AND BILGE PUMP	**CLASS DESIGN INSULATION DRAWINGS** DD692-S4700-10 **NAVY SPEC 33P2**

Figure 1. Examples of Turner Machinery
Equipment Containing Asbestos

Appendix E

In my personal experience, I can attest to the fact that the primary insulation used for ships (both Navy and commercial) was asbestos throughout engineering plants. Pump and valve gaskets, and packing were also asbestos. I served on board two destroyer class steam ships in the engineering departments and had personal exposure to asbestos on both ships. Experience with asbestos products occurred as well while serving as Repair Officer on a nuclear certified Destroyer Tender and serving at two Naval Shipyards, both of which overhauled destroyers like the Turner.

3. DeVries' Navy Career on the Radar Pickett Destroyer USS Turner (DDR 834)

Mr. DeVries was assigned to the USS Turner (DDR 834) specifically from 12 June 1957 until 8 June 1960 when he completed his active duty obligation. He served in the Engineering Department for the entire time. The Turner was a 'twin screw' Gearing class destroyer with steam driven General Electric geared turbines and Babcock & Wilcox boilers providing 60,000 shaft horsepower. Figure 2 is a thumbnail sketch of the ship.

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USS Turner (DDR 834)--Gearing Class Destroyer
(Radar Pickett)
• Builder: Bath Iron Works, Bath, Maine
• Laid Down:13 November 1944--
Commissioned: 12 June 1945
• Length/Beam: 390 ft/41 ft
Displacement:
3,460 long tons Crew Size 345

• Propulsion: Twin Screw, 60,000 SHP, 4 Boilers,
2 Steam Turbines. Speed: 35 Kts

Figure 2. The Principle Characteristics
of USS Turner (DDR 834)

Figure 3 is an outline of DeVries' career in the Navy on board the USS Turner:

SHIP	DATES	GRADE & TITLE	SHIP SCHEDULE & SHIPYARD PERIODS
CORNELL UNIVERSITY BS CHEMICAL ENGINEERING & NAVY ROTC			
NAVY, ACTIVE DUTY 1 JUNE 1957			
USS TURNER **(DDR 834)** **GEARING CLASS** **DESTROYER** **RADAR PICKETT SHIP**	12 JUNE 1957 – 8 JUNE 1960	ENSIGN (18 MOS.) LT JUNIOR GRADE (18 MOS) MACHINERY 'M' DIVISION OFFICER	**> 16 MAY 1957- NAVY BOARD OF INSPECTION & SURVEY, TARANTO, ITALY[9]** **> 12 JUNE 1957-DEVRIES REPORTS ABOARD TURNER** **> 9 SEPT-29 DEC 1957- REGULAR OVERHAUL, BOSTON NAVAL SHIPYARD (BNSY)**

9. U.S. Navy Board of Inspection and Survey Material Inspection Report, 16 May 1957

HOMEPORTS NEWPORT, RI & MAYPORT, FL		BOILER OFFICER MAIN PROPUL. ASSIST.	> 11-31 OCT 1957-DATE OF DRY DOCKING BNSY > 1959-SHIFTED HOMEPORT TO MAYPORT FL > 14-23 JANUARY 1959-TENDER AVAILABILITY ALONGSIDE USS EVERGLADES (AD 24), GENOA ITALY **> 24-25 MARCH 1959-NAVY BOARD OF INSPECTION & SURVEY. *SHIP FOUND TO BE UNSATISFACTORY IN ENGINEERING/ MACHINERY.*** FOUR

			OTHER CATEGORIES WERE ALSO UNSAT.[10] [11] > 9-10 SEPTEMBER 1959-OPERATION MERCURY SPACE CAPSULE RECOVERY EFFORT. > 13 JAN-12 AUG 1960-FRAM OVERHAUL, NEW YORK NAVAL SHIPYARD (NYNSY)[12]

10. U.S. Navy Board of Inspection and Survey Material Inspection Report, 24-25 March 1959

11. Naval message 26 March 1959: Commander, Destroyers Atlantic declares the ship "Unsafe and restricted from operating until major items corrected."

12. U.S. Navy Board of Inspection and Survey Material Inspection Report, 9-11 August 1960 (Post FRAM Overhaul).

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			> 20 JAN 1960-10 JULY 1960-DRY DOCKING (NYNSY) > 8 JUNE 1960-DEVRIES DEPARTS TURNER > 9-11 AUGUST 1960-NAVY BOARD OF INSPECTION & SURVEY & UNDERWAY TRIALS

Figure 3. DeVries' Career on USS Turner (DDR 834)

Appendix E

Exposure to asbestos while a ship is underway is possible, but generally reduced for engineering personnel when the ship is at sea unless there is a major casualty or repair required. Assigned to manage the four engineering spaces for a period of three years, what tasks would Ensign then Lieutenant junior grade De Vries have had that clearly exposed him to heavy concentrations of amosite asbestos as well as asbestos valve packing and gaskets? Underway, DeVries would have been in and out of the four main engineering spaces essentially non-stop.

For major ship at-sea evolutions, the Chief Engineer, DeVries' boss, would be stationed in the Forward Engine Room known as Main Control. DeVries, as Main Propulsion Assistant, would always be present in one of the four main engineering spaces.[13] There were three key evolutions mandating that these officers be present in the engineering spaces: General Quarters (battle stations), refueling every 3-5 days alongside a Navy oiler, and when entering and leaving port or an anchorage. DeVries was responsible for a large portion of the ship as shown by this ship profile in Figure 4, that is, both Boiler Rooms (BR) and Engine Rooms (ER).

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13. Main Control is the engine room that received direct orders from the bridge to control the ship's speed via propeller revolutions.

Appendix E

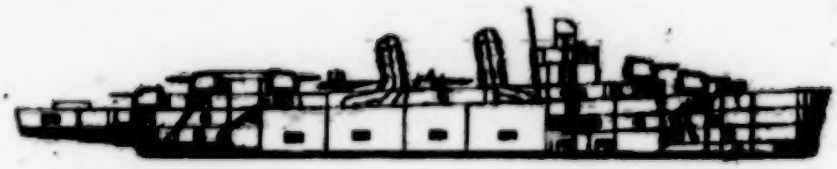


Figure 4. Starboard Inboard Profile for Gearing Class Destroyers[14 15]

4. Steam Equipment in the Turner's Engineering Plant. The design of turbines and pumps in marine plants of this era favored almost exclusively the use of steam driven equipment. The motor driven pumps for major systems were considered backup and utilized relatively infrequently. Steam equipment in the main engineering spaces was heavily lagged with amosite asbestos pads. By virtue of some hard lessons learned during World War II in the Pacific, steam propulsion and power generation had proven to be an extremely reliable design feature. The duplicate systems (forward and aft, port and starboard) added to the number of pieces of steam equipment. More importantly, the quantities of piping, pumps, and valves that contained asbestos increased dramatically. A Gearing Class destroyer contained approximately twenty (20) tons of asbestos.[16]

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14. BR-Boiler (Fire) Room, ER-Engine Room, DG-Diesel Gen Room, FO-Fuel Oil Tank, M-Magazine, Q-Crew Quarters.

15. U.S. Destroyers, An Illustrated History, Norman Friedman, Naval Institute Press, Annapolis MD, 2004.

16. Rushworth, Denis H., "The Navy and Asbestos Thermal Insulation", American Society of Naval Engineers Journal, Spring 2005.

Appendix E

Gearing Class Destroyers had a significant amount of equipment in **each** engine and boiler room. This amounted to approximately seventy main pieces of equipment for which Mr. DeVries was directly responsible. The steam equipment listed in the figure 5 table was insulated with asbestos and contained asbestos packing and gaskets.

EACH FIRE ROOM UPPER LEVEL	**EACH FIRE ROOM LOWER LEVEL**
2 MAIN BOILERS	
4 FORCED DRAFT BLOWERS	1 EMERGENCY FEED PUMP
1 FUEL OIL HEATER	2 FUEL OIL SERVICE PUMPS
1 FUEL OIL STRAINER	1 FIRE & BILGE PUMP
1 FUEL OIL BOOSTER/TRANSFER PUMP (#1 FR ONLY)	
EACH ENGINE ROOM UPPER LEVEL	**EACH ENGINE ROOM LOWER LEVEL**
STEAM TURBINES	5 MAIN FEED AND FEED BOOSTER PUMPS
DEAERATING FEED TANK	MAIN CONDENSER
FRESH WATER EVAPORATOR	3 LUBE OIL PUMPS & COOLER
LUBE OIL PURIFIER & HEATERE	MAIN REDUCTION GEARS

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SHIP SERVICE TURBO GENERATOR	2 FIRE & FLUSHING PUMPS
CONDENSATE COOLER	5 DISTILLING PLANT PUMPS

Figure 5. Equipment Containing Asbestos and Locations in Each of Turner's Engineering Spaces

While his M division enlisted crewmembers were standing watch (4 on, 8 off), they would have been taking hourly engine room equipment temperature and pressure readings with a clipboard on the upper and lower levels. Another typical task for his crew would be repacking a valve that had been leaking steam or tightening/replacing a steam piping joint that contained an asbestos flexitallic gasket. By his own testimony and conversation with me by phone, DeVries was frequently in close proximity to this work.

Figure 6 lists the specific equipment in the Turner's engineering spaces.

EQUIPMENT TD-TURBINE DRIVEN MD-MOTOR DRIVEN	**MANUFACTURER**
4-MAIN BOILERS	BABCOCK & WILCOX
2-MAIN STEAM TURBINES	GENERAL ELECTRIC
2-MAIN REDUCTION GEARS	DELAVAL

Appendix E

8-FORCED DRAFT BLOWERS (TD)	WESTINGHOUSE
2-MAIN CONDENSERS	FOSTER WHEELER
4-MAIN CONDENSATE PUMPS (TD)	DELAVAL
2-AUXILIARY CONDENSATE PUMPS (MD)	DELAVAL
2-MAIN CIRCULATING PUMPS (TD)	WARREN PUMPS-WESTING.TURB.
2- SHIP SERV. TURBINE GEN. (450 KW)	GENERAL ELECTRIC-WESTING. TURB.
2-AUXILIARY CONDENSERS	WORTHINGTON
2-AUX CONDENSER CIRC PUMPS (MD)	BUFFALO PUMP
2-AUX FEED BOOSTER PUMPS (MD)	DELAVAL
2-EMERGENCY DIESEL GENERATORS	GENERAL MOTORS & GE GEN.
1-DIESEL FUEL OIL SERVICE PUMP (MD)	NORTHERN PUMP
1 -CIRC PUMPS FOR EMERG DIESEL GEN.	WARREN STEAM PUMP CO.
2-DEAERATING FEED TANKS	ELLIOTT CORP.

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2-MAIN AIR EJECTORS	WORTHINGTON
2-AUX AIR EJECTORS	WORTHINGTON
4-MAIN FEED PUMPS (TD)	DELAVAL
2-EMERGENCY FEED PUMPS (TD)	WARREN STEAM PUMP CO.
4-MAIN FEED BOOSTER PUMPS (TD)	DELAVAL
4-MAIN LUBE OIL PUMPS (TD) & (MD)	DELAVAL
2-LUBE OIL COOLER	ALCO
2-LUBE OIL PURIFIERS (MD)	DELAVAL
8-FUEL OIL HEATERS	GRISCOM RUSSELL
4-MAIN FUEL OIL SERVICE PUMPS (TD) & (MD)	DELAVAL
2-FUEL OIL BOOSTER PUMPS (TD)	DELAVAL
1-EVAPORATOR PLANT (12,000 GPO)	GRISCOM RUSSELL
1-EVAPORATOR PLANT (4,000 GPO)	GRISCOM RUSSELL
2 DISTILLING PLANT AIR EJECTORS	CH WHEELER

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2-1ST EFFECT TUBE NEST DRAIN PUMPS (MD)	BUFFALO PUMP
2-EVAP. BRINE OVERBOARD PUMPS (MD)	BUFFALO PUMP
2-DISTIL.LER CONDENSER CIRC PUMPS (MD)	BUFFALO PUMP
2-DIST. COND. CONDENSATE PUMPS(MD)	BUFFALO PUMP
2-DIST. FW. WATER DIST. PUMPS (MD)	BUFFALO PUMP
2-FRESH WATER PUMPS (MD) (MD)	WARREN STEAM PUMP CO.
2-FIRE AND FLUSHING PUMPS (MD)	BUFFALO PUMP
4-FIRE & BILGE PUMP (TD) & (MD)	WARREN STEAM PUMP CO.
2-FIRE PUMPS (MD) (SMALL & LARGE) (MD)	GARDNER DENVER-GE MOTORS
1-HP AIR COMPRESSOR (TD) 3000 PSI	WORTHINGTON & STURTEVANT TURB.

Appendix E

1-LP AIR COMPRESSORS 100 PSI (MD)	WORTHINGTON PUMP
2-REFRIGERATION PLANTS	CARRIER CORP
MULTIPLE MAIN AND AUX. STEAM VALVES	2" CRANE
MULTIPLE STEAM TRAPS	YARWAY CORP
MULTIPLE STEAM REG. & REDUCING VALVES	GROVE REGULATOR CO.
MULTIPLE PUMP PRESSURE REG. VALVES	LESLIE
AUX. STEAM EXHAUST UNLOADING VALVES	A. & MORRILL & SWARTOUT CO.

Figure 6. USS Turner (DD 834) Engineering Space Equipment List[17]

Example of Thermal Insulation on a Marine Turbine. A notional example schematic of a naval steam turbine showing asbestos is shown below in Figure 7. The figure is relevant to DeVries's career working aboard

17. US. Navy Board Of Inspection & Survey San Diego, Materia/Inspection, Machinery Synopsis, USS Turner (DD 834) 9 June 1945.

a Navy destroyer with innumerable steam turbines for the main engines, generators, and pumps. The drawing demonstrates the extent of asbestos on one of the largest pieces of equipment in a Navy surface ship engine room. Schematics of the main boilers on a Navy ship presents a similar picture of significant insulation required.

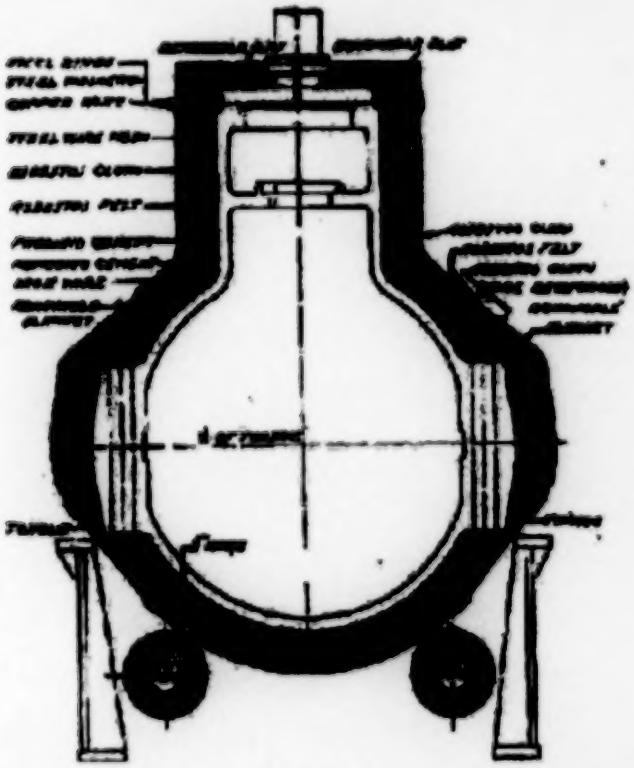


Figure 7. Cross section of generic and typical Naval steam turbine showing layers of asbestos cloth, felt, and blankets. Naval Ships Systems Command Technical Manual, NSTM 1959, Chapter 9390

Appendix E

In port is the most likely period that ship's force personnel would be exposed to asbestos products. This is particularly true for time spent in a shipyard or alongside a Destroyer Tender. The normal cycle for all U.S. Navy ships was a Material Inspection every three years by the U.S. Navy Board of Inspection and Survey (INSURV) before any shipyard overhaul period. Navy INSURV reports served as an initial first cut at the shipyard work list. **The March 1959 report found the Turner material condition to be unsatisfactory with particular emphasis on the steam machinery spaces. This validates my perception that the plant required a sizeable maintenance and repair effort to keep it running.** Turner's shipyard overhauls and work performed are addressed further in this affidavit in paragraph seven.

5. Personal Interview with John DeVries

On June 21, 2013, the plaintiff attorney, Alan Reich, and I spoke to Mr. Devries in a telephone conference call to discuss his career on the USS Turner and any specific details concerning his personal experience with the repair and maintenance of the Turner's steam systems. Primary points discussed:

- *As stated in his depositions, he emphasized that he became a hands-on engineer when he went aboard the Turner.*

- *He had little formal training in shipboard steam systems, thus his approach was to maximize his time*

in the four main engineering spaces, that is, both Boiler (Fire) Rooms and Engine Rooms.[18]

- *He learned by staying very close to the Boiler Technician(BT) and Machinist Mate (MM) ratings during the operation and maintenance of the turbines, boilers, pumps and valves.*

- *Recalls the removal of asbestos packing from valves—did not have the proper removal tools and use a screwdriver—described it as 'very messy.'*

- *Recalls work being accomplished on the forced draft blowers with the removal of insulation.*

- *He confirmed two shipyard periods at Boston (BSNY) and New York Naval Shipyards (NYNSY).*

- *Stated that he attended the DESLANT Engineering School in Newport during the Boston Naval Shipyard Overhaul.*

- *He met the ship at Naval Station Guantanamo Bay, Cuba, for Refresher Training following the Boston Naval Shipyard Overhaul. (This indicates that he was present aboard Turner for most of the overhaul and particularly at the front end when equipment removals took place, i.e., the period when most of the insulation, gaskets, and packing would have been removed).*

---

18. The U.S. Navy traditionally called the boiler space the Fire Room vs Boiler Room. The latter was common in merchant marine and commercial ships.

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- *During the FRAM shipyard overhaul period at NYNSY, he was in the main engineering spaces every day.*

- *He described close proximity to work being performed on the main boilers--boiler brickwork and insulating block.*

- *In Monte Carlo, Monaco, for major repairs to one of the General Electric turbine main engines during a Med cruise, had to stay aboard the ship because the top half of the casing had been removed for work to be accomplished. Thinks it was Kingsbury thrust bearing failure. Lagging pads were removed. Recalls going to Villefranche by train to support the repair effort.*

- *Recalls standing in the waterbox of one of Turner's main condensers due to leaking tubes that had to be plugged.*

- *Was in the main engineering spaces for General Quarters, underway refueling evolutions, and entering/leaving port, but did not specifically recall being stationed in one of the engine rooms.*

- *Stated that the ship was underway in late 1959 to support the Mercury Capsule recovery.*[19]

---

19. Mercury capsule shot and recovery 9/10 September 1959 and entitled 'Big Joe 1'; Turner was in company with many other ships.

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6. Formal Testimony of John DeVries. The following highlights a portion of DeVries's three depositions that confirm the type and extent of work that he performed on the USS Turner (DD 834)[20]

JOHN B. DEVRIES DEPOSITION
JANUARY 15, 2013

* * *

[76]Q. What type of work do you recall being performed in your vicinity?

A. Some of the boilers had to be opened up, tubes cleaned. The slag between the tubes had to be cut out.

Q. Do you know if any of the work on the boilers involved the use of asbestos-containing materials?

[77]**A. Insulation. And when it was removed it was dusty.**

Q. And when you say insulation, is this exterior insulation on the boilers?

A. Yes.

Q. Whose job was it to perform the maintenance or repair work on the boilers?

---

20. Depositions of John B. DeVries January 15, 16 & 17, 2013; pages as marked. Administrative items, objections, etc., have not been included.

A. If it was done by ship's company, sometimes if it was done by a Navy Yard or a destroyer tender sometimes. In all cases I had to be present and involved in it.

* * *

[78]**Q. You told us about the insulation. Do you associate asbestos with any other products through work on the boilers?**

A. Work on the boilers involved the blowers, involved pumps. All of these had insulation.

* * *

[97]Q. Going back to the pumps, when you said that the flanges were cleaned if a pump had to be taken offline, how would that occur?

A. They'd be scraped. They'd be brushed, wire brushed. I don't think we had the luxury of an electric drill with a wire wheel. So they would be done manually. And this too would create a cloud of dust.

Q. What were you scraping from the flanges and pumps?

A. The broken seal.

* * *

[98]**Q. Would it be safe to say you supervised others who performed the work?**

A. I was right on top of the sailor doing it.

* * *

[211]As you sit here today, sir, do you have any belief that any of the work that was performed to any of the **Warren pumps aboard the TURNER exposed you to asbestos?**

A. Yes.

[212]**Q. And what aspect of the work or what work?**

A. Well, number one, removal of insulation created a cloud of dust. And I was in that cloud of dust.

A. Number two, the repacking which we've talked about. And, number three, the seals on the flanges which we've talked about.

Q. Okay. And as far as your basis for any of the insulation or the packing or the sealing work containing asbestos, what is the bas is of your belief that those products contained asbestos?

A. It was well known in the profession, in the industry that asbestos was the only way to insulate high temperatures.

* * * *

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JOHN B. DEVRIES DEPOSITION
JANUARY 16, 2013

* * *

[390]Q. Okay. Do you remember whether or not they were insulated?

A. They were insulated or parts or connections were. And I'm unclear as to the details of those.

Q. Was it necessary over the three years that you were on the TURNER to supervise or be involved in the maintenance or repair of any of these four Westinghouse forced draft blowers?

A. Eight blowers.

A. And, yes, we repaired them.

Q. And would that have exposed you to asbestos, to your knowledge?

A. The insulation portion of the removals yes.

Q. Okay. And did that make dust?

A. Yes.

Q. Did you breathe it?

A. Yes.

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* * *

[391]Q. How many, how many forced draft blower turbines were there on the TURNER from Westinghouse?

A. Eight.

* * *

[392]Q. And would it be necessary to maintain those eight blowers and turbines?

A. Yes.

* * *

[392]Q. And would the maintenance require handling or disturbing any of the insulation that was on it?

A. Insulation on the turbine on the steam end...

Q. And how frequently would that occur among the eight?

A. Several of the blowers were relatively trouble free and only required routine maintenance. **Several of the blowers seemed to be very temperamental and require frequent maintenance.**

* * *

[397]Q. Okay. And was it necessary to disturb or remove any of the insulation on the Westinghouse turbines that were attached to those pumps?

A. In most cases it would have to have been.

Q. Did that make dust?

A. Any time you remove insulation, or at least in my experience on the TURNER, any time insulation was disturbed you got dust.

Q. And did you breathe that dust?

A. Yes. And if you were close to it and [398]unfortunately I knew no better I was close to it all the time either instructing somebody or looking, inspecting for myself.

Q. So specifically when removing or handling the insulation on the Westinghouse turbines attached to these pumps did that give off dust that you breathed?

A. Removal of insulation on the pump turbine would have given off-- did give off dust and I would have breathed it.

Q. Okay. Were there any warning labels on any of the General Electric equipment as to the dangers of asbestos?

THE WITNESS: None.

Q. Were there any warning labels on the Westinghouse equipment on the TURNER with regard to the dangers of asbestos?

A. None.

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* * *

[419]Q. And do you remember whether the replacement gaskets were from a sheet gasket material or were they precut, if you remember?

A. I don't remember.

Q. Okay. With regard to the old pieces of gasket that were being removed and chipped off and wire brushed, what would happen to those?

THE WITNESS: Be discarded.

Q. Well, where would they end up while they were being removed?

A. Probably in a little pile of trash alongside where the person was working.

Q. And whose job was it to sweep that stuff up and get it out of there?

[420]A. I guess the sailor who did the work cleans--

A. -- was trained to clean up after himself

Q. Did the sweeping of these asbestos gasket pieces or packing pieces, what would happen when that was swept up?

THE WITNESS: I can't of personal knowledge be certain. You get some dust.

* * * *

JOHN B. DEVRIES DEPOSITION
JANUARY 17, 2013

[34]Q. Okay. And the hot -- the pumps that had hot applications, did they need any special treatment that the cold water pumps might not have needed?

A . As I stated earlier, anything that is hot needs to be insulated either through enhance the -- or maintain the efficiency of the unit or to protect the crew from damage, from burns.

Q. And what materials would have been used, to your knowledge?

A. These were insulation, sometimes blankets, sometimes mud.

Q. And that would have been made out of [35]what for the high temperature applications?

THE WITNESS: When the TURNER personnel made up mud in repairing insulation it was asbestos mixed with water.

Q. And did that process make dust?

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A. That made some dust also.

* * * *

7. Board of Inspection and Survey Reports and Shipyard Periods.

There were three Board of Inspection and Survey Material Inspections that relate to the condition of the USS Turner's engineering space equipment. These inspections were normally conducted just before a shipyard overhaul and identified the ship condition and resultant work that had to be scheduled. Ships that historically indicated continuing problems significantly increased the amount of work required to keep them 'on line' and ready to meet operational commitments. This in and of itself would have an impact on the extent to which the crew including DeVries were exposed to asbestos products. INSURV reports not only produced a long list of engineering space discrepancies but also added specific tasks and repair items for the yard to focus on at the next overhaul. Part of the process was to identify the shipyard jobs were most urgent, that is, INSURV also created priority list.

What are the typical shipyard overhaul requirements for marine turbines, boilers, steam pumps, valves and piping? Whenever a shipyard conducted repairs to steam systems, there were necessary piping, pump, and valve removals and repairs which always involved the removal of asbestos lagging, gaskets, and packing. Where does the asbestos dust come from that DeVries referred to in his deposition? The asbestos products that would have to

have been removed and replaced in the steam systems during overhaul and maintenance periods could be quite extensive. For example, the only way to remove lagging on a steam piping or to gain access to a valve is to cut it off, usually with a knife similar to that used for sheet rock. This instantly produced asbestos dust particles. The removal of lagging and insulation is an unavoidably messy business--cleaning up the inevitable dust fell to the lower rates of ship's force. A ship during overhaul such as Turner often had the ships' ventilation systems shut down and the high volume exhaust and supply fans normally present in engineering spaces would not be operated. The likely engineering space contamination for shipyard and ship's force personnel then becomes even worse. More likely than not, Mr. DeVries would have been present for most of these evolutions on the Turner during the two overhauls.

The lengthy 1960 FRAM overhaul at the New York Naval Shipyard was particularly significant as a source of exposure to asbestos. Ships from the Gearing class were completely torn down and rebuilt from the hull up, including new engines, a much larger combat information center, and new sonar and radar systems. This modernization was designed to extend the life of the destroyer by at least eight years.

a. TURNER INSURV 16 MAY 1957-PRE BOSTON NSY OVERHAUL INSPECTION

The INSURV in May 1957 in preparation for the Boston Naval Shipyard overhaul is a good indication of the ship condition when DeVries walked aboard one month later.

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The following is a partial list of the items from that report. **Particularly noteworthy is the finding about lagging and insulation in the engineering spaces stating that 75% of the lagging needed to be replaced. From my experience, this meant piping, valves, and turbines.** Noteworthy also is the work required on the boiler that was opened for inspection--it is a good assumption that the other three boilers not inspected would require a similar amount of work.

REPORT OF MATERIAL INSPECTION
OF
U.S.S. TURNER (DDR 834)
HELD
16 MAY 1957

PIPING VALVES AND FITTINGS	i. The piping valves and fittings are, in general, in satisfactory condition. The piping in the bilges, including the HP and LP drains and the Bilge and Ballast System are in poor condition. Pipe hangers and braces in the bilges are corroded and rusted.
RECOMMEND	(1) Replacement of pipe hangers and braces. Replacement of HE drain system with heavier piping and replacement of section LP drain and Bilge and Ballast System which have not been removed by tenders.

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LAGGING	j. Lagging in both firerooms and enginerooms is in unsatisfactory condition.
RECOMMEND	(1) Renewal of approximately 75% of lagging by Naval Shipyard.
BOILERS	m. There are four (4) Babcock and Wilcox 3 drum, express type, divided furnace, single uptake, superheat controlled boilers installed operating at a pressure of 600 psi at 850F. There are two boilers in each fireroom. The steaming hours since last cleaning as of 24 March 1957;

Inspection of No. 4 boiler revealed the following defects:

(1) Excessive slag on deck both on saturated and superheat [missing text]

(2) Plastic front cracked on both sides.

(3) Back walls and slopes spalling on both sides.

(4) Studded tubes on both sides required patching with [illegible] ore.

(5) Bailey feed water regulator inoperative. Does not hold water level and is not completely connected.

(6) Drain holes plugged. Leakage of fuel oil from burners into air casing occurs.

(7) Boiler requires better preservation underneath.

(8) Superheater inspection plates and exonomizer not opened for inspection.

(9) All main steam hanger springs in poor state of preservation due to rusting.

b. TURNER INSURV 25 MARCH 1959-PRE NYNSY FRAM OVERHAUL INSPECTION

Discrepancies identified by the INSURV board inspection report conducted prior to the 1960 FRAM overhaul conducted at the New York Naval Shipyard essentially speaks for itself. **The turbine driven pumps in the engineering spaces were in a disastrous condition and would require overhaul and the main boilers received an unsatisfactory grade as well.** It appeared that the FRAM may have been close to being cancelled and/or the date slipping while major repairs to the Turner were accomplished. The fact that the FRAM was shifted that summer from the Norfolk yard to the New York Naval Shipyard is a strong indication of the decision process.

Appendix E

DDR834/9030

EN3-6(1)

60c-59ecr 25 March 1959

Subj: USS TURNER (DDR-834) – Material Inspection; report of

VII – MACHINERY INSTALLATION

1. The Board finds the Machinery Installation, Equipment and Spaces to be, in general, in unsatisfactory condition.

9. The following discrepancies existed on the pumps open for inspection:

No. 1 main feed pump was completely unsatisfactory: The impellers were loose on the shaft; the wearing rings and carbon packing badly worn; the upper half of the carbon packing cover required a heavy gasket to make it steam-tight; the shaft sleeves and throat bushings were worn and should be replaced and there was a bolt lodged in the inlet to the second stage impeller (Item 2s). The tie rods on No. 3 fire and bilge pump were deteriorated and the exhausted valve leaked (Item 17s). The suction valve to No. 2 auxiliary circulating pump leaked (Item 18s). The thrust washer on No. 4 main lube oil pump was badly worn (Item 19s). The governor and turbine bearings in No. 4 main feed booster pump and No. 2 fuel oil transfer pump required

replacement (Items 20s and 21s). The wearing rings in No. 3 main condensate pump and No. 4 main feed booster pump were worn and unfit for further service (Item 22s). In addition, both condensate pumps were heavily contaminated with oil (See Boiler Feed Water Equipment).

12. Boilers - unsatisfactory. The boilers consist of four (4), double cased, divided furnace, 3-drum, single uptake, express type boilers manufactured by the Babcock and Wilcox Company. The following discrepancies existed:

The seats on all boiler safety valves required machining (Item 4s). The superheater flame protection strips in Nos. 1 and 2 boilers were burned and required replacement (Item 5a). Oil was present in the economizers of Nos. 1 and 4 boilers and reported to be in Nos. 2 and 3 (Item 8s). The "A" and "C" safety valves on No. 3 boiler required resetting (Item 28s). The burners in No. 4 are in need of alignment to prevent oil impingement on the water screen tubes (Item 29s). Air casing leaks were reported on all four (4) boilers (Item 30s). The nozzle in the IH soot blower in No. 1 boiler had a fin missing (Item 31s). The handhole plates on No. 3 boiler leaked during the hydrostatic test and several valves also leaked (Item 32s). Bricks from the door of No. 2 boiler were fused to the deck (Item 33s). The front in No. 4 boiler was cracked and deteriorated (Item 34s). Two (2) Yarway steam flow indicators required calibration (Item 35s). A hydrostratic test was held on No. 2 boiler and the pressure dropped 140

lbs. in six (6) minutes. This rapid drop was caused by the "C" safety valve leaking a surface blow valve and salinity cock leaking and slight weeping of handhole plates in the superheater, water wall and water screen headers. Safety valves on No. 3 boiler were lifted and reseated as follows:

14. There were eight (8), horizontal, 2-stage, forced draft blowers manufactured by the Westinghouse Corporation. The propeller bearing on No. 7 required replacement and the journal required stoning (Item 37s). The counterweight on No. 8 was inoperative due to a sheared pin (Item 38s). Reversible lube oil pumps were installed on all blowers.

c. TURNER INSURV 15 AUGUST 1960-POST FRAM OVERHAUL INSPECTION

Mr. Devries was on board for most of the FRAM overhaul. The INSURV inspection in 1960 was conducted three days after the FRAM overhaul completed. **The first item below describing pumps states that "the majority of pumps installed for main and auxiliary machinery had been overhauled ..." and this confirms that the FRAM overhaul was extensive. The boiler portion identified significant boiler tube renewal on all four boilers.** This gives an indication of the scope of work that was undertaken.

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DDR834/9030

EN3-6(1)

10-61 WGW:ecr 15 August 1960

Subj: USS TURNER (DDR-834) – Combined Underway Trials and Material Inspection: report of

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VII - MACHINERY INSTALLATION

10. The majority of pumps installed for main and auxiliary machinery had been overhauled and were in good operating condition based on trials conducted. The low fire main pressure which existed while using the two (2) electric driven fire and flushing pumps throughout the trial period and their overall adequacy as to capacity is deemed to require evaluation (Item 38s). Auxiliary turbines for the main circulating pumps had excessive leak-off from the turbine glands (Item 19s). Various leaks were noted at pump ends and turbine ends of installed main feed pumps (Item 17s). Various auxiliary turbines lacked stop or finger pieces at turbine exhaust valves as required by plan.

13. The boiler installation was comprised of four (4), Babcock and Wilcox, divided furnace, superheat control express boilers rated at 615 PSI and 850° outlet temperature. Operation of the boilers was satisfactory during the trials. Tests of "A" actuator safety valves of boilers Nos. 1 and 3 revealed that these actuator valves did not reseat at prescribed pressure of 615 PSI.

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It was noted in ship's boiler tube renewal charts and indicated by ship's engineer officer that extensive renewal of tubes had not been effected during overhaul, the following boiler repairs having been effected.

Chemical cleaning of watersides and 150% hydrostatically tested plus renewal of most brickwork and installation of burner tile in the four (4) boilers. Sample tubes were removed and radiographic inspection was also made.

Boiler No. 1 LA, LB, LC rows plus 144 tube exploring block in saturated side at rear of drum at outboard side.

Boiler No. 2 LA, LB, LC rows plus 3 superheater side wall stud tubes.

Boiler No. 3 LA, LB, LC rows plus 14 superheater side wall stud tubes, W-X-Y row saturated side tubes, about 16 superheater tubes at superheater (outlet) lower pass.

Boiler No. 4 LA, LB, LC rows plus 5 superheater side wall stud tubes.

8. Labeling of Asbestos as Hazardous. Requirements for Asbestos Warnings.

a. Industry Requirement to Warn. This portion of the affidavit addresses the requirement for Navy and marine equipment vendors to provide asbestos warnings in the technical manual and drawings provided to support Navy ships. That is, the asbestos insulation, packing,

and gaskets for pumps, valves, and piping located in the steam systems on Navy ships from the period from 1940-1980. The technical manuals and drawings produced by equipment manufacturers did not contain asbestos warnings for the insulation, gaskets, or packing installed on the equipment provided to the Navy. There were no caution labels on the asbestos shipping containers as well. There is no record that any firm placed asbestos document warnings or on the asbestos packaging for items supplied to the Navy.

In order to address this issue, my approach was to examine to what extent industry as well as the Navy knew about the hazards of asbestos. For hazardous substance requirements, one can examine the 1936 General Specifications for Machinery. This stated quite clearly what was required as standard practice:[21]

> **Sl-l-h. Instruction books and pamphlets.**
> **1. Instruction books will be furnished by contractors and subcontractors for main propelling machinery, boilers, air compressors, main forced draft blowers, centrifugal pumps as required by Subsection S47-2, positive displacement rotary pumps as required by Subsection S47-3 and other auxiliary machinery, Electrical installations and other important Naval equipment furnaced by them. These instruction books will contain all necessary pertinent information to insure efficient and economical use**

21. General Specifications for Machinery, Bureau of\Ship, Navy Department, Subsection Sl-1 PLANS, 1 December 1936, Pages 1-29

of equipment, such data and information as may be required by the applicable specifications under which furnished, and in general, the following:
(a) General description, including also sufficient sketches, illustrations, and sectional assemblies with appropriate references to drawing numbers and titles.
(b) Installation instructions.
(c) Operating instructions.
(d) Instructions for care and maintenance.
(e) Safety precautions.
(f) Index. titles.

Defendant equipment suppliers and their experts consistently state that only the Navy had complete knowledge of the asbestos hazard issue during this forty-year period. Defendant expert opinions utilize this reason as one of the major arguments for the equipment industries failure to warn. I have reviewed relevant industry documentation as well and, in direct contrast, consider industry's full knowledge of asbestos hazards to be at least as equal to that of the U.S. Navy.

The core question then addressed in this affidavit is whether or not the Navy would have allowed asbestos warnings to be placed in the technical manuals and drawings if they had been submitted by the equipment vendors. Navy equipment vendors showed no hesitation to place numerous warnings and cautions for other safety and health hazards in their manuals for machinery maintenance and operation. If both industry and the Navy were aware of the asbestos hazards, was there not a clear

obligation for the equipment manufacturers to submit asbestos warning and caution labeling in the technical manuals and drawings that they produced?

b. Industry and Government Both Aware of Asbestos Hazard.

I have examined numerous industry and government documents that addressed the safety issues surrounding asbestos. I sampled and examined sizeable numbers of the Navy Destroyer DD 692/710 Class machinery equipment technical manuals and drawings provided by the vendors, shipyards, and design agents that were reviewed and approved by the U.S. Navy during this period.[22] In the industry documents reviewed , I have not discovered any cautionary indications, footnotes, etc., which state that asbestos was hazardous and/or required crew members and shipyard workers to take precautions when coming in contact with or inhaling asbestos particles.

There were numerous marine equipment vendors that provided the U.S. Navy with machinery that required asbestos gaskets, packing, and high temperature insulation for their turbines, pumps, piping, and valves. The suppliers were required by the Navy to furnish the requisite drawings and technical manuals as required in the contract. Vendor equipment manuals of this era were replete with warning labels and cautions for safe

22. In reviewing manufacturer drawings and technical manuals, vendor equipment drawings are available to a lesser extent than those of the initial ship design and construction drawings provided by the shipyards and class design agents.

operations and maintenance for a variety of subjects. These included hazardous materials but never included asbestos. **In point of fact, the machinery vendor drawings and purchase orders did place asbestos products on their own drawings.** An example of asbestos listed directly on a manufacturer document is the Crane Co. drawing on stop valves for Navy World War II destroyers in Figure 8. Asbestos gaskets and packing were listed on their own drawing.[23]

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23. Crane Co. drawing 22391, Bronze Stop Valve was on two pages. Figure 1 is a portion of subject drawing rearranged to minimize space.

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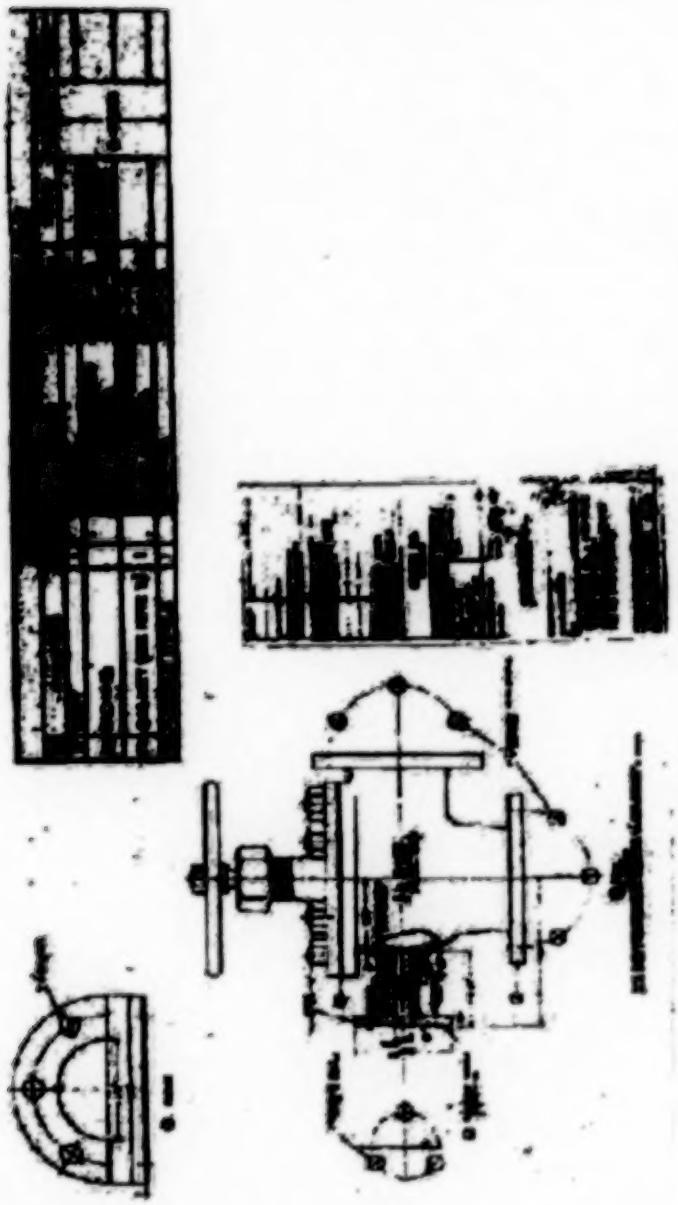


Figure 8. Crane Co. drawing 2.5" bronze stop valve for Navy Destroyer 692/710 Class

This confirms that the vendors surely knew that their equipment contained asbestos gaskets, packing, and insulation. Although many equipment vendors have stated that they 'did not participate in making the requirements' for technical manuals and drawings, the record shows otherwise.

Some turbine manufacturers' drawings included insulation hooks for asbestos in their outer casing drawings. These drawings could easily have been annotated with asbestos cautions and warnings. As an example, a 1958 Westinghouse turbine drawing for a nuclear powered Polaris submarine USS James Madison (SSBN 627) states that the machinery shall be insulated with the Navy Bureau of Engineering specification that invokes asbestos cloth.[24]

Defendant equipment suppliers repeatedly imply that the Navy had 'superior knowledge' about asbestos hazards. This is a not so subtle attempt to establish that 'we really never knew that asbestos was a hazard'. The marine vendors' argument then follows is that, because they themselves were not aware of the danger posed by asbestos, they therefore had no need to identify the hazard using caution captions and labeling on the equipment drawings, in the technical manuals, or on the packaging.

There are however, multiple examples of the marine equipment industry having clear knowledge of asbestos hazards in the 1940-1970 time frames. Some companies actually labeled asbestos as hazardous. Some asbestos vendors were labeling their shipments as hazardous as

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24. Westinghouse drawing 906J406 USS James Madison (SSBN 629) Insulation Attachments and Nameplates 8 Dec. 1958

early as 1964. In a 1975 internal office memorandum, one can see in Figure 9 that many companies did have asbestos warnings on their products, specifically:

Subject: WARNING LABELS

After an exhausted search, I think we're the only ones who answer interrogatories (most of this information came from the *Borel* transcript). I have found the following co-defendants first placed warning labels on their products containing asbestos as follows:

Pittsburgh Corning	**1968**
Fibreboard	**Approx. 1966**
GAF	**Approx. 1965**
Unarco	**Early 1970**
Celotex	**None-they quit making asbestos containing products in 1969**
Philip Carey	**Unknown (In *Borel*, they stated no warning labels as of 1970)**
Owens Corning	**February 1967**
Eagle Picher	**May or June 1964**
Ruberoid	**Approx. 1965**
Standard	**None (as of 1970)**

Figure 9. Listing of Companies Labeling Asbestos as a Hazardous Material as Early as 1964[25]

25. Johns Manville Internal correspondence to DH Markusson from Kip Johnson, December 3, 1975(Document received highlighted as shown)

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I have personal knowledge that some of the asbestos products from these ten companies listed did go to support U.S. Navy ships. In 1965 aboard the destroyer USS Davis (DD 937), Eagle Picher manufactured an asbestos containing compound (Eagle 66) used in the engineering spaces while I was on board. I recall this product vividly. I was a young Ensign and Boiler Officer in training to be the Main Propulsion Assistant (MPA) under the guidance of the very demanding Chief Engineer, LT Gary Herzberg. He told me to search out the Chief Petty Officer for the firerooms and "find out what Eagle 66 cement was and how it was mixed properly for use in the boiler."

Industry involvement in the asbestos supply process was not a secret. On the record below are senior Naval officers and their staff at the Navy Bureau of Ships who were meeting quite regularly with executives from the private insulation, gasket, and packing industry. Figures 10, 11 and 12 are samples of the meeting minutes.[26] [27] In April 1959, the National Insulation Manufacturers Association Spring meeting minutes cited below included insulation suppliers such as Eagle-Picher, Johns Manville, Owens Corning, The Ruberoid Co., and Union Asbestos & Rubber Co. The minutes in figures 10 and 11 show not only the close relationships to the U.S. Government organizations, but also the serious industry interest in insulation safety concerns.

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26. Report of National Insulation Manufacturers Association (NIMA) Washington DC trip dated 27 August 1964, page 3 of 3.

27. Minutes of Spring Meeting National Insulation Manufacturers Association (NIMA) 13 April 1959 page 4 of 8.

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7. Assist members in preparation of insulation specifications for Government Agencies such as Military, Army, Navy, Air Force, Corps of Engineers, Department of Commerce, General Services Administration, Coast Guard, Federal Housing Authority, etc.

8. Study and report any data on general safety problems connected with insulation uses such as toxicity, fire safety, etc. Review Underwriters', American Gas Associations' (and others) Approval on Insulating Materials

Figure 10. April 1959 Spring Meeting, National Insulation Manufacturers Association

At a luncheon meeting August 27, Capt. McGillicuddy, Bureau of Ships, was made acquainted with the purposes of NIMA Technical & Research Committee in working with his department on Navy insulation problems and specifications. Present were Messrs. Kincaid, Tower, Sinclair and Parlett. Later on August 27, Messrs. Stsrickland and Parlett called on Mr. Chilcote, Code 344, Bureau of Ships in reference to status of certain Navy specifications on which NIMA had made recommendations. He advised that Proposed Spec FCS 5640 on Fibrous Glass would not be put through with the NIMA recommended changes given to the Navy in Mr. Barnhart's letter of July 9, 1959. He stated that Spec MIL-2781c which covers various types of high temperature pipe insulation

and had been in the interim form for some time had now gone to the printer in final form. Spec MIL-2819 which covers various block insulations was being revised to climinate the hardness requirements which had become obsolete.

Figure 11. August 1964 Discussions between the Navy and Industry on Insulating Products

Noteworthy in April 1964 are the meeting minutes of NIMA that showed Johns Manville was already placing asbestos caution labels for their products, figure 12:

5. It was reported that Johns-Manville Sales Corp., was printing on cartons, crates, etc., containing asbestos products (calcium silicate, magnesia, asbestos cements) a note pertaining to the dust created be these materials. The wording will be as follows:

   "**Caution:** This product contains asbestos fiber.

   Inhalation of asbestos in excessive quantities over long periods of time may be harmful.

   If dust is created when this product is handled, avoid breathing the dust.

   If adequate ventilation control is not possible wear respirators approved by the U.S. Bureau of Mines for pneumocoriosis producing dust."

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ADJOURNMENT

There being no further business

The meeting was adjourned.

Respectfully submitted

/s/_____
J. M. Barnhart

Figure 12. April 1964 Board of Directors Meeting, National Insulation Manufacturers Association[28]

Concerning industry knowledge of asbestos hazards, another industry organization was very conscious of the detrimental effect on workers at asbestos plants. This was the Asbestos Textile Institute with a large body of corporate members. Examples of items discussed:[29]

- April 7, 1949 meeting minutes:

  √ "The secretary read excerpts from an article entitled 'Cancer and Environment' ... published in Scientific American January 1949. It was felt that the information here unjustifiably incriminated asbestos as a carcinogenic material...

28. Minutes of Board of Directors Meeting National Insulation Manufacturers Association (NIMA) 14 April 1964.

29. Asbestos Technical Institute minutes: April 7, 1949 and December 1 1954.

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- December 1, 1954 meeting minutes:

  √ "The program for the study of the relationship of heart disability to asbestosis ... and the autopsy studies ... were reviewed in detail."

  √ "The research proposal from Dr. Schepers for investigation into the relationships of asbestos and pulmonary cancer is anticipated ... Asbestos as a cancer-producing agent is receiving international attention ..."

  √ "The committee agreed that they would continue the inquiry into engineering control of dusts .... controls at the fiber batching ... methods of bag handling and dumping"

In Figure 13, the Institute's Air Hygiene and Manufacturing Committee minutes of this organization in 1965 addressed the concerns of asbestos :

Minutes: Air Hygiene and Mfg. Committee

Review Current Publicity on the Effect of Asbestos on Public Health

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The following articles were reviewed and discussed:

1. "Dangerous Dust" – Scientific American, December, 1964 - Volume 211.

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2. "Cancer Experts Eye Asbestos in Alarm/ Cancer Experts Eye Asbestos Perils," by Josephine Robertson. The Plain Dealer, January 12, 1965, Cleveland, Ohio.

Review and discussion of these articles keeps members of the committees up to date on the publicity Asbestos is receiving relative to Public Health.

There have been some customer inquires about dust control. Each member company has the pamphlet "Method for Determining Asbestos Dust Concentration," which they can forward to help educate their customers on testing dust concentration and also recommending control where necessary.

Conference – "Biological Effects of Asbestos"
October 19-21, 1964
New York City

Since our October meeting we have shipped out 17 copies of above mentioned pamphlet. This makes a total of 147 copies to date. Balance on hand is approximately 886 copies

Figure 13. Asbestos Technical Institute Meeting Minutes on Asbestos Hazards[30]

30. Asbestos Technical Institute minutes February 8, 1965.

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The purpose of the above portions of these associations documents is not made to be read with any specific conclusions. **The purpose is simply to show that early on industry was well aware of the hazards from asbestos as a possible lung disease and cancer-causing agent.** The 'government only' asbestos information cited by defendant experts were easily accessible in the public arena in the Congressional Record from the U.S. Government Printing Office. This confirms my opinion that the Navy did not necessarily possess 'superior knowledge' on the subject.

The line of reasoning that the Navy had 'superior knowledge' compared with the equipment manufacturers about the hazards from asbestos products actually argues against the defendant rationale. That is, their primary hypothesis is that the Navy would never have allowed warning and safety precautions in the vendor documents had they been submitted. Yet at the same time they state the opinion that the Navy was the only party who knew asbestos was hazardous. **What possible sense would it have been for the Navy to refuse these asbestos warnings if the Navy possessed 'superior knowledge' as was claimed by industry?** More likely than not, any warnings on asbestos submitted by industry would have routinely been included in the Navy technical manuals without any rigorous challenge. To the extent that both knew, it was clearly a failure to properly inform the operating Navy and shipyard workers.

As cited earlier in this affidavit regarding Westinghouse and Crane Co. products, the drawings and/or technical manuals did show attachment points and specific asbestos

design details for their equipment. Another example of industry design participation is a Navy/industry meeting at New York Shipyard concerning optimum ways to insulate aircraft carrier plants with asbestos and other products.[31] My experience in ship construction is that the building yard and equipment vendors (selected by the yard) are both deeply involved in translating the Navy contract drawings into detailed waterfront production drawings to actually build the ship.

Industry played an absolutely vital and prominent role, not only in the ship design itself, but also in the shipboard equipment specifications. **Without question, Navy specifications were the overarching requirements for insulation, packing and gaskets, but the specific design decisions were left to the vendor.** That is, the governing specifications and requirements were prescribed by the Navy, but the design details almost always fell to the equipment manufacturer. The Navy has never had sufficient staff to micromanage every aspect of the ship design, logistics, construction, or overhaul processes. This was especially true for equipment technical manual review and approval. The equipment companies had constant correspondence with the Navy technical manual review personnel at Buships. This aspect is addressed in my discussions with engineers who worked at Buships on page 33 of this affidavit.

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31. Kitty Hawk Class Aircraft Carrier High Temperature Pipe Insulation Forum, USS Constellation (CVA 64), New York Naval Shipyard, letter 22 December 1958 (Lists asbestos insulation industry attendees, Navy representatives, and equipment suppliers)

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It is my opinion that the asbestos insulation, gasket, and packing suppliers had knowledge of asbestos hazards. It follows logically that the machinery equipment providers would also have had knowledge of the asbestos danger to personnel. As routine practice, representatives of the vendors and manufacturers of Navy steam equipment quite regularly visited the shipyards and the ships before, during, and after construction or overhaul to ensure that their equipment was installed and operating properly. Larger companies such as Westinghouse and General Electric often had offices in the yard to support their equipment. Their company plant personnel were present when government inspectors visited to address the progress of Navy equipment under contract. My personal experience with two tours as a Navy program manager in Washington, DC, as well as the Commanding Officer at Supship Pascagoula, confirms that this practice continues to this day. Equipment vendors are always requested to join ship's force and yard workers on board for the dock trials and underway sea trials. Their equipment would be covered with asbestos insulation installed; asbestos gaskets and packing removal and installation would have been observed on ships such as the Turner and in the shipyard shops. More likely than not, as colleagues on a common team, equipment suppliers would have been aware of discussions of asbestos hazards when interfacing with the public and private shipyards.

In 1947, warnings were published by the Secretary of the Navy in which very strong language was used to address the dangers from asbestos exposure and the need for respirator protection. **One finds it very difficult to**

believe that marine steam equipment manufacturers and asbestos product suppliers had no knowledge of the dangers of asbestos given the documents such as this in existence at the time.[32]

c. Navy and DOD Published Documents on Technical Manual Requirements.

What were the written requirements for technical manuals and packaging published by the government? **None of the guidance documents from the Navy's Bureau of Ships or Department of Defense precluded warnings.** Technical manuals and drawings of this era in the shipyard waterfront production shops and Engineering Departments aboard ship did contain many warning labels and safety precautions for items other than asbestos. My review of these documents shows these items clearly marked and highlighted whenever the vendor felt it necessary. Given the presence of various warning labels, one can infer that the Navy did not restrict these warnings and caution labels that no doubt came straight from the vendors of marine steam equipment.

Below are seven examples of government issued documents addressing technical manual requirements supporting the concept that industry warning labels for asbestos would have been accepted by the Navy:

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32. Executive Office of The Secretary of the Navy Bulletin (NAVEXOS) P-52, Vol 4, No. 1 January 1947, Page 13.

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i. The initial Navy addressing the requirements for the preparation of 'Instruction Books' is Specification **35B2 (INT)** published in 1945,[33] later superseded by the technical manual specification series **MIL-T-15071**. This document focuses extensively on format details. It contains sections for equipment description (clearances, tolerances, etc), operation, maintenance, parts lists and plans and drawing formats. The clear flavor of this 27-page document is one of solicitation, that is, the government expected the vendor to ensure that they had completely provided all information needed to properly maintain and operate the machinery. While there is no separate section on the requirements for safety hazards and warning labels, this omission does not necessarily mean that they would have been excluded. The document is silent; if important for the Navy to tightly control such information in these manuals, why did the document not address warnings of all types i.e., spell the policy out and show examples or state that they shall be kept to a minimum?

ii. The follow-on 1950 document to 35B2 on technical manual preparation is **Military Specification, Books, MIL-B-15071 (SHIPS)** which contains essentially the same information with the continuing heavy emphasis on technical specifications and format. However, on page three is added:

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33. Books, Instruction--Preparation, Contents and Approval, BUSHIPS Specification, 35B2(1NT) 1 July 1945.

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"3.3.1.1 General Data – This division shall contain data such as the following:
(a) Safety notice-(where high voltage or special hazards are involved)"[34]

Given this additional note at the front of the revised specification, how is one able to maintain that the Navy would not have considered and possibly accepted a warning on asbestos hazards?

iii. **Military Standard MIL-STD-129,** Marking of Shipments original dated 9 August 1951. This is a series of Department of Defense documents that became the bible for shipping and packaging. There have been numerous revisions to it up to and including 129P issued in 2007. The MIL STD 129 purpose is to provide and maintain uniformity while marketing the packages and shipping containers for military equipment and supplies. Section 2 of the April 1957 version 129B does require labeling for hazardous chemicals in accordance with the Manufacturing Chemists Association to which many of the equipment suppliers belonged. Many Navy machinery specifications invoke MIL 129 as a requirement. Examples are MIL-V-1187B (1956), Valves, Angle and Globe Valves and, MIL-P-17840B (1962) Pumps, Centrifugal, Close-coupled. Many of the asbestos insulation, packing, and gasket MILSPECS also invoke MILSTD 129.

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34. If the Navy was so controlling and reticent to include safety warnings, is it not significant that safety is listed first under General Data?

iv. **The 1954 updated specification MIL-T-15071** does contain an illustrative example of how the warning labels were to be depicted. This is interpreted that the Navy did place clear emphasis on this matter.

v. **SECNAV 5100.8 Instruction of September 1956 Uniform Labeling Program for Hazardous Industrial Chemicals and Materials.**[35]

Marine equipment suppliers and experts have declared that this document does not apply to the asbestos hazards. Examination of this document shows that it was written by the highest echelons in the Navy. **Insofar as it literally states that it applies to the entire 'Naval Establishment' why would it not have related to all products containing asbestos materials, i.e., lagging, packing, and gaskets?** The markings and design of the labels on hazardous industrial chemicals and materials were clearly required. The claim that this document did not invoke specifics on labeling and in technical manuals is an attempt to identify that as a major shortcoming on the Navy's warning requirements. However, in the second paragraph it states that the label requirements for suppliers are governed by **state and federal law.** The vendors would have to abide by those rules. The SECNAV instruction states that most manufacturers follow the guidance

35. Secretary of the Navy Instr. 5100.8 dated 24 September 1956, Uniform Labeling Program for Hazardous Industrial Chemicals and Materials.

in the warning labels guide published by the Manufacturing Chemicals Association. Many of the industry equipment vendors would have to comply.

The stated scope of this document is:

> "This instruction applies to the **labeling of all materials throughout the Navel Establishment** wherever distribution of hazardous chemicals and materials is made to the actual consumer (shop, office or unit)."

And

> "This instruction is based on the composite of the procedures recommended by the Manufacturing Chemist' Association ... the American Conference of Governmental Industrial Hygienists, ... and the labeling programs presently in effect at the Naval Gun Factory, the Alameda Naval Air Station and the **Mare Island Naval Shipyard.**" (emphasis added)

Defendant experts such as Roger Horne attempt to support the conclusion that this document did not apply to Navy equipment. His opinion is that this instruction is not a specification and not meant to cover a product like a pump or valve or a material like asbestos in general use aboard a

naval vessel. It is not at all clear after reading the Navy Secretary's words about applying to the entire 'Naval Establishment' why it would or could not have related to all products containing asbestos materials, i.e., lagging, packing, and gaskets? These products did come on board in packages during the life of the ship and were sent by the vendors and original equipment managers (OEMs).

vi. **The 1959 Bureau of Ships Technical Manual** general guidance addresses suggestions to improve the contents of the manual: "Liberal constructive criticism and suggestions are invited from the service-at-large concerning the arrangement, scope and subject matter of this manual in order that revisions will contain all instructions, information, and data which experience shows to be necessary for the use of personnel of the Navy." It seems clear that the Navy organization responsible for the approval of technical manuals was not at all reticent about receiving input and feedback from all sources on technical matters.

vii. **The 1969 version of MIL-T-15071** has no less than twenty two (22) references to safety warnings and precautions. The tone of this document constitutes an appeal, essentially tantamount to a demand for the vendors to ensure that all hazards are identified in their technical manuals.[36]

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36. Military Spec. Technical Manuals for Mechanical & Electrical Equipment, MIL-M-15071G (NAVY) 1 Aug. 1969.

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Based on the SECNAV instruction, the MIL-T-15071 series, and the MIL Standard 129 series, suppliers were required to label asbestos as hazardous. Some companies did follow this requirement. Owen Corning written guidance to a printer on January 19, 1967, contains directions for the packaging of Kaylo asbestos pipe insulation packaging.[37] The guidance provided to the printer was a sample 3 X 2.5 inch sign:

THIS PRODUCT CONTAINS ASBESTOS FIBER

IF DUST IS CREATED WHEN THIS PRODUCT IS HANDLED, AVOID BREATHING THE DUST

Although the 15071 specification series and other written requirements cited above clearly spelled out the need, defendant companies and their experts continue to argue that any requirement to include hazardous information would have been rejected. The reason given is primarily because the earlier documents did not emphasize cautions and labels. This appears to be an illogical conclusion in view of the clear safety and warning instructions in the 1969 10571 G version of the specification in which the need for safety precautions is made quite clear. **That defendant hypothesis would have one believe that something happened in 1969 such that, for no apparent reason, the Navy decided to readily allow warning hazards to be placed in the Navy's technical manuals.** One must

37. Owens Corning written purchase order for label printing, January 19, 1967.

ask what changed the government's approach to these safety matters over time--or was the possibility always present as potential additions to Navy equipment vendor documents?

d. Technical Manual Review & Approval Procedures.

Defendant arguments on labeling are expressed repeatedly in the expert testimonies such as those written by Home and Sargent. The central thrust of their testimony is that the Navy exerted 'draconian' control over the equipments' performance and operational characteristics via Military Specifications and other written documents. It states that the technical manuals and drawings were controlled to the letter of the law. If paraphrased, this implies that 'If the government had wanted warning labels in the manuals- they would have to ask for them.'

Defendant expert testimony repeatedly states that the Navy's interest was completely focused on ensuring that the equipment met the government's written design and operational requirements. My findings agree with this view. **That is, the design requirements and operating parameters for machinery were the items closely controlled and monitored for compliance by the Navy.** How then does the logic follow that this ironclad rigor would unavoidably apply as well to generic warning labels? Would the Navy reviewers have paid much attention to proposed warning labels given that their undisputed major interest was in the above key design and operational categories?

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During my Naval service, I observed numerous warning labels and safety precautions for hazards other than asbestos included in technical manuals and drawings for ships constructed during the period in question. **It seems folly to believe that the Navy directed each and every one of these warnings.** For the numerous warning labels and cautions other than asbestos which appeared in the technical manuals, does it not seem more likely that the vendors submitted the draft documents with warning labels included for review prior to publication? On the other hand, should we believe that the Navy actually directed each of these to be put into the manuals?

My opinion is that the warning labels and safety precautions submitted by the ship equipment vendors were routinely approved by the Navy reviewers, probably without second thought. Who would know more about their own equipment, the vendor, or the government? Defendant argument that the Navy did not want excessive warnings in their technical manuals is made without foundation and is not contained in any documents that I have reviewed for numerous cases. **The U.S. Navy has always placed personnel safety on the highest pedestal.** A typical example may be seen in the Foster Wheeler boiler technical manual for the aircraft carrier USS Kitty Hawk (CVA 63).The boiler Safety Precautions are included as a full page *at the front of the manual, even before the technical manual's index.*

I reviewed the technical manuals and operating instructions of a sampling of vendors with asbestos containing products similar to ships like the destroyer Turner. They are listed here as figures 13 through 16 with

examples of the type of warnings and safety precautions that were commonly seen throughout the Navy. Some are specifically for hazardous material in the same general category as asbestos.

1. **WESTINGHOUSE FUEL OIL AND LUBE OIL PUMPS.**

CARE OF THE COOLER

Step 1. The oil cooler should be cleaned whenever objectionable increase in pressure drop through the unit, or decrease in cooling efficiency, is observed. When either of these conditions is noted, remove the core assembly from the case and cover and clean it.

Step 2. To clean the inside of the plates, immerse the core in a suitable cleaner or solvent. (CAUTION: This operation should be done in the open air or with adequate ventilation.)

Forced circulation of the cleaner fluid through the plates by means of an ordinary grease gun or rubber suction cup will facilitate cleaning the oil passages.

Figure 13. Sample Caution Paragraph in Westinghouse LO/FO Pump Instruction Book[38]

38. Westinghouse Instruction Book, Main Lubricating Oil, Fuel Oil & Fuel Oil Booster Pumps, DD 445 Class (45 Destroyers listed) Navships 347-0266, Westinghouse Electric & Mfg. Co., 1942, Page 12

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These pumps also contained John Crane asbestos packing that conformed to Navy specification 33-P-17, Symbol No 40.

2. WESTINGHOUSE 750 KW TURBINE GENERATOR SET.

MAINTENANCE

1. Place valve handle in position to divert all fluid flow thru filter not to be serviced.

2. Slowly open drain, when depressurized, fully open vent and drain fittings.

3. When filter has drained remove bottom container nut. Remove container downward with a twisting motion to aid in loosening container from the O-ring seal.

4. Remove cartridge assembly jamnuts from center stud.

5. Remove cartridge assembly with care downwards.

6. Proceed in accordance with Page 3 of 3 attached.

   A. When filter is used with 2190-TEP or similar fluids, the following cleaners are recommended:

      1) Primary Cleaner: Turco Products Turco Carb, Pensault Co. Delchem 43A, Branson Co. AGISOLV 14, Oil Cleaning Compound FSN 6850-292-9700 or Turbine Flushing Oil FSN 6850-281-7454

2) Secondary Cleaner: Stoddard Solvent, Perchlorethylene FREON PCA FSN 6850-033-8851 or Stoddard Dry Cleaning Solvent FSN 6850-274-5421

3) Ultrasonic Cleaner: Trichlorethlyene, Perchlorethylene, Freon TF

7. Reinstall cartridge assembly and jamnuts. Reinstall container and container nut. Close drain valve.

8. Move diverter valve to proper position to allow fluid to flow thru the cleaned filter; close vent when all air has been vented. Inspect for leaks.

CAUTION: THE ABOVE CLEANERS ARE TOXIC. AVOID BREATHING VAPORS AND CONTACT TO THE SKIN. PROVIDE ADEQUATE VENTILATION AND PROTECTIVE CLOTHING.

Figure 14. Sample Material Hazard Warnings in Westinghouse Turbo-Generator Equipment Manual[39]

By specific count of 296 pages, there are no less than 105 'Warnings', 'Cautions', and 'Notes' highlighted throughout this Westinghouse manual. This averages

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39. Westinghouse Equipment Manual for 750 KW AC Turbine Generator Set, Destroyer Escort DE 1052 Class (46 Destroyer Escorts) Navships0961-053-9011, Westinghouse Electric & Mfg. Co., 1970 w/1974 CH 2, Liquid Filter (Rockwell Corp.) portion of Turbine and Gear Section, Page 1 of 3.

approximately one caution reminder present on every third page of the manual. Not included are the approximately 150 additional pages of drawings and replacement parts list included in the manual. As in the Westinghouse fuel and lube oil pumps above, there are asbestos products as well listed in the drawings for this Westinghouse equipment.

3. WARREN PUMP CO. MAIN CONDENSER CIRCULATING PUMP WITH WESTINGHOUSE TURBINE.

Care of Oil Cooler

Step 1. The oil cooler should be cleaned whenever an objectionable increase in pressure drop through the unit, or decrease in cooling efficiency, is observed.

When either of these conditions is noted, remove the core assembly from the case and cover.

Step 2. To clean inside of plates, immerse the core in a suitable cleaner or solvent.

(CAUTION: This operation should be done in the open air or with adequate ventilation.)

Forced circulation of the cleaner through the plates by means of ordinary grease gun or rubber suction cup will facilitate cleaning the oil passages.

Step 3. Blow out with high-pressure air, or steam. Repeat operations until thoroughly clean.

Figure 15. Sample Material Hazard Warnings in Warren Pump Instruction Book with Westinghouse Turbine[40]

4. GENERAL ELECTRIC DESTROYER SHIP'S SERVICE GENERATOR.

There are three types of grease solvents which may be used for cleaning the insulated windings of electrical apparatus. These are benzine or gasoline, carbon tetrachloride, and a mixture of benzine or gasoline with carbon tetrachloride. The characteristics of these grease solvents are the following:

BENZINE OR GASOLINE: Either benzine or gasoline is very inflammable, and their vapors mixed with the proper percentage of air are quite explosive. If this type of solvent is used, there should be good ventilation, and every care taken to avoid fire risk. Care should also be taken to see that the workers' clothes do not become saturated with the solvent. Clothing which does become saturated with the solvent should be removed before the worker leaves the job.

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40. Warren Steam Pump Company. Instruction Book. DD 692 Class Destroyer (DDs 692 through 856), Main Condenser Circulating Pump w/ Westinghouse Steam Turbine. Warren Pump Co, Warren MA, 1944, Page 19.

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Of the three types of solvent, benzine or gasoline has the least corrosive action on the insulation varnish and should therefore be used in preference to the other solvents where conditions permit.

CARBON TETRACHLORIDE: Carbon Tetrachloride is noninflammable and nonexplosive.

This solvent is much more corrosive in its action than either benzine or gasoline. As it is a solvent of rubber, it should not be used on the leads and any other parts where rubber insulation is used. Care must be taken to protect adjacent parts also from corrosion. Because of its toxic effect, adequate ventilation must be provided. With these precautions, carbon tetrachloride, which evaporates quickly, may be used for cleaning the windings with small risk of damage. Its use is preferable where fire risk is high.

MIXTURE: A mixture of 50 percent carbon tetrachloride and 50 percent benzine, or 60 percent tetrachloride and 40 percent gasoline, is noninflammable; but the vapors mixed with the proper amount of air are explosive. There should be fair ventilation so that the explosive fumes will not accumulate. There is no particular danger from spilling these mixtures on the clothing. This solvent may therefore be used where there is fire risk, but only where

the ventilation is sufficient to prevent the accumulation of an explosive mixture of fumes.

OPERATION OF CLEANING THE WINDINGS: Waste or a dry cloth should be used to wipe as much of the oil or grease from the winding as possible. Then waste, or a cloth, moistened with one of the recommended solvents should be used for cleaning the windings. Inaccessible parts of the machine may be reached with a swab moistened with solvent, or in some cases a spray of the solvent may be directed at the winding with sufficient force to wash away the oil.

Whenever possible, the parts which have been cleaned should be dried with clean waste or rags in order that the insulation varnish may not become soft from prolonged exposure to the solvent. If the varnish coating of the windings shows considerable deterioration, the windings should be retreated with a varnish furnished by the manufacturer. In any case, the machine should be given an opportunity to dry out thoroughly before being placed in service.

Figure 16. Sample Material Hazard Warnings in General Electric Instruction Book[41]

41. General Electric Instruction Book, 400-KW AC + 50-KW DC Ship's Service Turbine-Generator Set for U.S. Destroyers, DD 692 Class, NAVSHIPS 361-1316. General Electric Co., Marine Turbine & Gear, Lynn, MA (Est 1942), Page 49.

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5. FOSTER WHEELER ENERGY CORPORATION.

From my own experience as a certified Navy Fleet Boiler Inspector, Navy boilers were a very heavy maintenance burden to the Navy and we frequently studied the technical manual.[42] A typical boiler manual is that of Foster Wheeler containing more than 250 pages. This 1976 manual lists an estimated 100 'Warning' and 'Caution' notes throughout. **The first page of the manual consists solely of safety to personnel. The message here is clear: the Navy always paid the highest attention to personnel safety.**[43]

I have reviewed many written exchanges between the Navy and industry vendors concerning steam plant equipment on ships that dealt with the contents of drawings and technical manuals that involved the need to comply with the Navy's specifications. My review and personal interviews with senior U.S. Navy military and civilian personnel stationed at the Navy Bureau of Ships confirms that the dialogue on technical matters between the parties was frequent and rich. This close channel of communication was likely present during World War II and into the 1960s, in part due to the large numbers of

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42. I served on the USS Davis (DD 937) as Main Propulsion Assistant with identical Foster Wheeler separately fired superheater "D" type boilers.

43. Foster Wheeler Energy Corp., Technical Manual, Description, Operation and Maintenance Instructions, 1200PSI Main Boiler D Type. NAVSEA 0951-LP-035-9010, USS Kitty hawk, April 1976, Page iv.

ships being built at high production rates. Teamwork was paramount and visible at all levels of industry and the Navy. **It is hard to believe that the parties would have been quibbling over warning and caution labels that were in the technical manuals.**

The government allowed and promoted complete and unfiltered communication between the U.S. Navy engineers and technicians in Washington, DC and the vendors who furnished the steam equipment before, during, and after the procurement process and ship construction cycle. This included not only the technical manual reviews but also the production delivery schedules and in plant quality inspections. The numerous and varied technical manual letter exchanges between the Navy and vendors that I have reviewed primarily addressed equipment specifications and operations--items such as bearing clearances, material properties, troubleshooting procedures, performance curves, operating parameters, repair parts, repair procedures, special tools, shock requirements and administrative clerical and format corrections.

During this process, there is insufficient written record to demonstrate that the various marine vendors ever attempted to place warnings for asbestos hazards that were subsequently rejected by the Navy. It is my opinion that, similar to other personnel hazards and warning label recommendations, the U.S. Navy would very well have considered inclusion into the technical manuals and drawings had they been made. Documentation of Navy and government rejections of asbestos cautionary notes

may exist of which I am not aware. However, none of the documents or expert opinions reviewed to date have so identified any such evidence.

It is my opinion that the marine equipment vendors never submitted asbestos warnings in draft technical manuals or vendor drawings. **What seems so extraordinary and implausible from defendant industry and their experts is the opinion that the vendors would never have even requested that warning labels be included– how can anyone possible posit that theory without specific documentation?** When questioned about it in his testimony, Martin K. Kraft speaking on behalf of Buffalo Pumps in a 2006 Rhode Island testimony states that he had never seen anything in writing that the Navy instructed the company "not to warn about potential health hazards."

e. Specific Details of the Technical Manual Process.

The subject of warning labels contained in technical manuals was specifically addressed with a civilian employed at the U.S. Navy Bureau of Ships in the 1952-54 time frame.[44] He had personal knowledge of the technical manual processes. Mr. Joe Yurso was assigned to the area of shipboard pumps, air conditioning, and refrigeration systems. At the time a young engineer, he stated that there was persistent, complete, and unfiltered dialogue between the engineers at Bushipsand marine equipment

44. Captain Joseph F. Yurso, USN (Ret), personal discussions, April and May 2008.

manufacturers' representatives, vendors, and ship design agents such as Gibbs & Cox.

In discussions with now retired Navy Captain Yurso, he identified specifically the use of Freon 12 as a substance that had to be handled with care. As he recalls, safety precautions were included in the ship equipment vendor technical manual submission, reviewed, and approved by the Navy. He stated to me:

> "During the time I was assigned to Bushipe in the early 1950s, my colleagues and I looked to the vendor as the experts for their equipment. Back in those days, we actually personally negotiated the procurements for shipboard equipment directly with the manufacturers. Any face-to-face discussions centered mostly on operating parameters and performance requirements. Frankly our shop focused heavily on the format of the manual, that is, we wanted the technical manuals for the equipment to be USN technical manuals with Navy numbers and not commercial type manuals. We never did review or approve the technical manuals all that closely. *I can't imagine that, had they submitted any warning labels for nay hazardous substances, we would have questioned them -- any more than we questioned them on the operating instructions and safety precautions warnings that were placed in the manual and drawings. They were the most knowledgeable.*"

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Captain Yurso stated that the working level technical exchanges on the contents of the draft technical manuals were open and methodical. It is his opinion that, if a Navy steam product manufacturer had approached the Navy about any hazardous material, they would have received a willing ear. That is, more likely than not, such a warning label would have been considered. That is not to suggest that the warnings would definitely have been added, only to counter arguments that the supplier would never have considered including it with the draft with a view toward adding it to the tech manuals by the Navy.

Discussions with Mr. Cliff Geiger, a senior Navy civilian ultimately promoted to the Senior Executive Service (SES-flag officer equivalent), indicated much the same perception as Captain Yurso. After detailed personal discussions, I found him to be a knowledgeable, convincing, and reliable government representative. As a young engineer, he joined Bushipe in 1966 when asbestos was still not identified as a hazard. His recollection of the process is as follows and is paraphrased here:[45]

- He seemed somewhat incredulous when I told him the industry position that the 'Navy would not allow warnings.' Said he could not imagine the Navy turning down a warning label.

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45. Former civilian government employee and member of Senior Executive Service with US Navy, achieved title as Deputy Commander for Logistics, Navsea in 1984, personal discussions April and May 2000. He has since passed away.

- There was close dialogue between Buships workers and industry representatives to discuss the manual contents.

- Buships actually did not read the tech manuals that closely--tended to take whatever industry put in.

- Navy looked hard at the operating procedures, bearing clearances, specifications, etc, warning labels were well below the radar.

- He cited the warnings that were present in the submarine manuals for dealing with the fluids for cleaning systems. Of all areas, the submarine folks were the most meticulous ... so if they did not have a problem with warning labels, doubt that the surface Navy did either.

- They kept an audit trail of the comments on the manual back and forth to industry.

- Believes that there was no malicious intent, i.e., that neither party really knew the extent of the asbestos hazard until early 70s.

Defendant experts suggest that they have personal knowledge of what the Navy would have done in this process at the time in question. That is, even if industry equipment vendors had recommended placing asbestos warning labels in their technical manuals, the Navy would never have allowed them due to the Navy's non-deviation standards for the contents of technical manuals.

Therefore, the Navy would not allow asbestos warning labels had they even been suggested by the vendors. I have seen no written documentation on record to support that uncompromising conclusion.

The fact that the Navy exercised tight control over the design and manufacturing requirements of Navy shipboard equipment cannot be denied. There is sufficient documentation in the specifications and drawings to support this level of authority. However, this discipline does not necessarily or even logically include the lack of asbestos hazard labeling. On this subject, my discussions with personnel cited above actually at the Bureau of Ships performing this function have a higher level of credibility. **Their opinion is that any hazardous material warnings or labels submitted by the vendors would have been considered and probably approved and published. There is nothing in the record that demonstrates that the Navy would not have entertained labeling for any hazardous materials in their technical manuals.**

f. Asbestos Hazardous Warning and Labeling Summary.

Both the United States government (Navy and also Maritime Commission), asbestos vendors, and marine equipment industries in general were aware or should have been aware of the hazards from asbestos from the World War II era and on--even earlier than that. The research to support this concept and the cornerstones for this opinion are:

> **Industry documents identifying asbestos as a hazard;**

> **Corporate associations containing agenda items on asbestos hazards;**

> **Government and Navy asbestos knowledge present in the public domain;**

> **The close working relationship between the equipment vendors and Bushipsstaff;**

> **The onsite industry presence at construction and overhaul shipyards.**

There were rich and frequent exchanges between the Navy ship equipment industry and government technical staff and engineers writing and reviewing the technical manuals prior to Navy approval and printing. That the Navy clearly maintained very tight control of the contents and format of approved and published technical manuals is not disputed.

After examining the review process between the parties, the technical manual content always centered on:

> **Design requirements—technical specifications, e.g., bearing clearances;**

> **The performance requirements, e.g., gallons per min;**

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> **Detailed operating procedures, e.g., machinery start up and securing;**

> **Use of the proper formats and ensuring written consistency.**

Clearly the above four aspects of equipment specifications were the Navy's foremost focal points. Conversely, vendor manuals and drawings did contain specific warning labels and precautions about hazardous materials other than asbestos. **There is simply no record of the Navy excluding any safety precautions or warning in technical manuals.**

The preponderance of asbestos defendant legal arguments and expert opinions that I have examined concludes, seemingly without question, that the Navy equipment vendors and industry in general were not allowed to place asbestos warnings in their documentation. Defendant theory is that the Navy would never allow industry to request, recommend, or strongly suggest that asbestos warnings be placed in the subject documents. This mindset is repeated by maritime industry suppliers and vendor defendant experts as an incontrovertible fact--an article of faith and a refrain which must be accepted with absolute certainty.

This attempt at such a 'black and white' conclusion seems seriously flawed and subject to dispute because of the lack of any clearly established foundation with written corroboration contained in documents from that time period. *That is, there is insufficient written*

documentation to fully substantiate the opinion supporting the concept that the U.S. Navy would not have included warning labels if they had been suggested by the Navy and merchant marine ship equipment vendors.

I have been unable to find any written document, indication, manifestation, suggestion or evidence that the Navy had established such a policy specifically about personnel hazards and warning labels during this era of United States Navy shipbuilding, ship modernizations, and overhauls. The governing specifications in fact convey just the opposite and demonstrate the importance of safety to the Navy. The fundamental question remaining is why, given that asbestos was a known hazard to all, did the industry technical manuals and drawings not include asbestos warnings?

g. Summation.

Based on extensive review of documentation and the lack of any compelling written evidence, it is my steadfast opinion that the U.S. Navy would never have prevented the vendors of Navy and merchant marine ship steam equipment from submitting asbestos caution and warning labels in their draft technical manuals and drawings. It is also my opinion that if these asbestos warnings had been submitted, more likely than not, the Navy would have included them in the technical manuals and drawings.

Appendix E

(c) Primary exhibits and references used as support for the opinion.

1. Deposition of John B. DeVries, January 15, 2013
2. Deposition of John B. DeVries, January 16, 2013
3. Deposition of John B. DeVries, January 17, 2013
4. US Navy Officer Muster Roles, John B. DeVries 1957-1960
5. John B. DeVries Plaintiff's Answers to Defendants' General Interrogatories, January 10, 2013
6. John B. DeVries Complaint, December 28, 2012
7. USS Turner (DD 834) Board of Inspection and Survey Official Dock Trial & Machinery Synopsis, June 9, 1945
8. Mechanical Equipment Test Procedures for Destroyers DD 692-890, Fed. Shipbuilding & Drydock Co, 14 Sept 1943
9. U.S. Navy Board Of Inspection & Survey Material Inspection, USS Turner, 16 May 1957
10. U.S. Navy Board Of Inspection & Survey Material Inspection, USS Turner, 25 March 1959
11. U.S. Navy Board Of Inspection & Survey Material Inspection, USS Turner, 15 August 1960
12. General Specifications for Machinery, Bureau of Ships, Navy Dept., Subsection S1-1 PLANS, 1 December 1936
13. Westinghouse drawing 906J406 USS James Madison (SSBN 629) Insulation Attachments and Nameplates 8 Dec 1958
14. Crane Co. Drawing 22391, Bronze Stop Valve, April 7, 1944
15. Johns Manville Internal correspondence to DH Markusson from Kip Johnson, December 3, 1975

16. Report of National Insulation Manufacturers Association (NIMA) Washington DC trip dated 27 August 1959
17. Minutes of Spring Meeting National Insulation Manufacturers Association (NIMA) 13 April 195
18. Minutes of Board of Directors Meeting National Insulation Manufacturers Association (NIMA) 14 April 1959.
19. High Temperature Pipe Insulation Forum Constellation (CVA 64), New York Naval Shipyard, letter 22 December 1958
20. Owens Corning written purchase order for label printing, January 19, 1967
21. General Specifications for Ships of the United States Navy, Bureau of Ships, Section S39-2, Thermal Insulation and Acoustic Absorptive Treatment for Machinery, Piping and Ducts, 1 July 1954
22. Books, Instruction--Preparation, Contents and Approval, BUSHIPS Specification, 35B2(INT) 1 July 1945
23. Secretary of the Navy Instr. 5100.8 dated 24 Sept 1956, Uniform Labeling Pgm for Hazardous Indust. Chem. and Materials
24. Military Spec. Technical Manuals for Mechanical & Electrical Equipment, MIL-M-15071G (NAVY) 1 Aug. 1969
25. Westinghouse Instruction Book, Main Lubricating Oil, Fuel Oil & Fuel Oil Booster Pumps, DD 445 Class Navships 347-0266, Westinghouse Electric & Mfg. Co., 1942
26. Westinghouse Equipment Manual for 750 KW AC Turbine Generator Set, Destroyer Escort DE 1052 Class Navships 0961-053 -9011, Westinghouse Elect. & Mfg. Co., 1970 w/1974 CH 2

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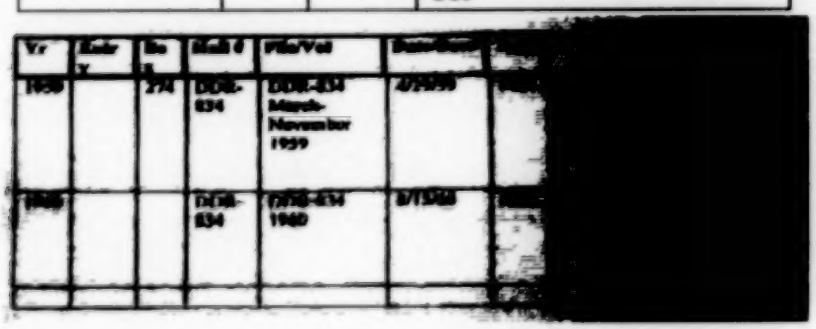
27. General Electric Instruction Book, 400-KW AC + 50-KW DC Ship's Service Turbine-Generator Set for U.S. Navy Destroyers, DD 692 Class, NAVSHIPS 361-1316. General Electric Co., Marine Turbine & Gear, Lynn, MA (Est 1942)
28. Warren Steam Pump Company. Instruction Book, DD 692 Class Destroyer (DDs 692 through 856), Main Condenser Circulating Pump w/Westinghouse Steam Turbine. Warren Pump Co, Warren MA, 1944
29. Foster Wheeler Energy Corp., Technical Manual, Description, Operation and Maintenance Instructions, 1200 psi Main Boiler "D" Type. NAVSEA 0951-LP-035-9010, USS Kitty Hawk, April 1976
30. Executive Office of The Secretary of the Navy Bulletin (NAVEXOS) P-52, Vol4, No. 1 January 1947
31. Documents provided by Jack Lopez from National Archives.

MUSTER ROLLS: John B. DeVries 558982

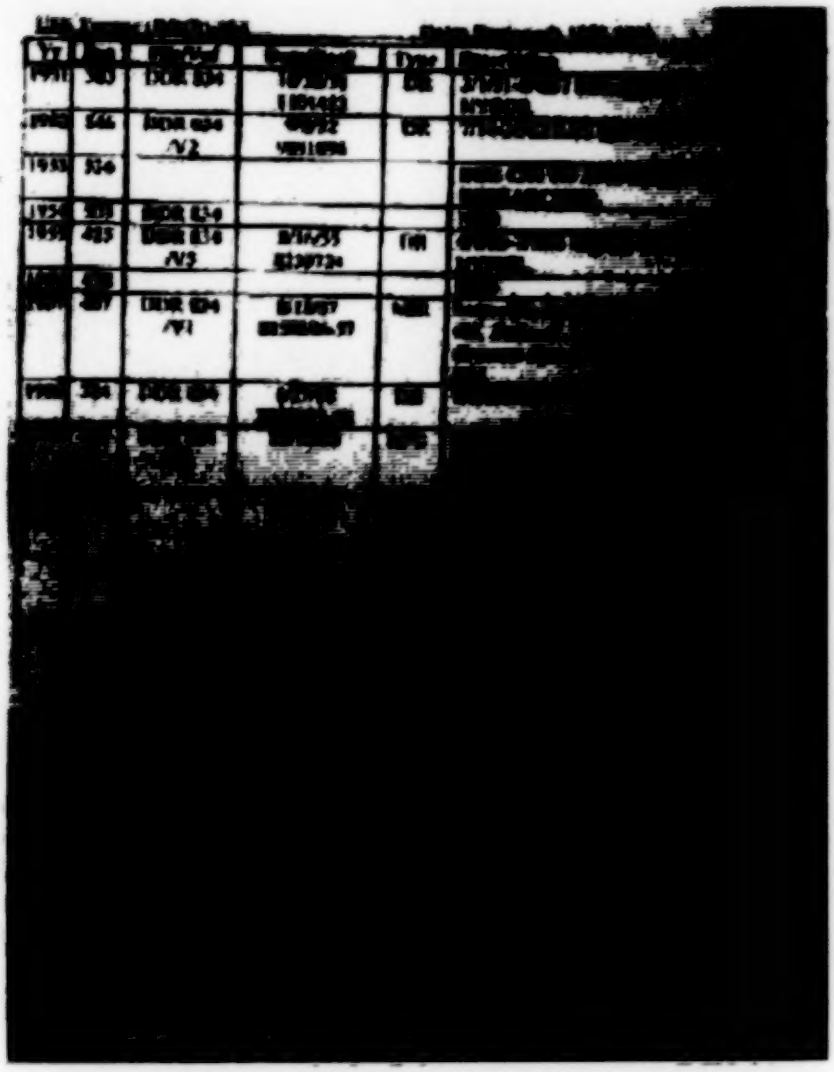
Location	Yr	Rate	Doc. Date/Type
USS Turner DDR-834	57	ENS	12 June 57. Rec for duty from NROTC Unit Cornell University.
USS Turner DDR-834	57	ENS	Nov. 57 Quarterly BUPERS REPORT
USS Turner DDR-834	57	ENS	12/31/57 Quarterly BUPERS REPORT
USS Turner DDR-834	58	ENS	3/31/58 Quarterly BUPERS REPORT

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USS Turner DDR-834	58	ENS	6/30/58 Quarterly BUPERS REPORT
USS Turner DDR-834	58	ENS	9/25/58 Quarterly BUPERS REPORT
USS Turner DDR-834	58	ENS	12/31/58 Quarterly BUPERS REPORT
USS Turner DDR-834	59	LTJG	3/31/59 Quarterly BUPERS REPORT
USS Turner DDR-834	59	LTJG	6/30/59 Quarterly BUPERS REPORT
USS Turner DDR-834	59	LTJG	9/30/59 Quarterly BUPERS REPORT
USS Turner DDR-834	59	LTJG	12/31/59 Quarterly BUPERS REPORT
USS Turner DDR-834	60	?	Name is legible but dates are not. Quarterly BUPERS REPORT
USS Turner DDR-834	60	LTJG	8 June 60. Rel to inact duty in Navites eff 9 June 1960. BUPERS Orders 031302 of 7 April 60.



Appendix E



d. The qualification of the expert, including a list of all publications authored.

Please see Attachment (1), my resume.

e. A listing of other cases in which the expert has testified or been deposed.

Listed in Attachment (2) to this report.

ATTACHMENT (1) RESUME OF EXPERT

R. Bruce Woodruff, Captain, U.S. Navy (Ret)

SUMMARY

Leader with unique background of manufacturing and engineering management experience working in private/public sector with a wide range of corporations covering the contractual, technical, and quality aspects of the design, construction and maintenance of U.S. Navy and U.S. Coast Guard Ships. Navy Captain (Engineering Duty Officer) with three major commands in program management for the ship construction and repair of Navy ships. Qualified as Chief Engineer for the operation of steam propulsion ships. Expert witness supporting asbestos and Mesothelioma litigation for both Navy and commercial ships and shipyard personnel. Knowledge and familiarity with the resolution of large government and industry shipbuilding and ship repair contract claims. Division Vice President and General Manager of high technology manufacturing plant of large turbines and generators for the utility industry nationwide. Significant experience with high dollar manufacturing programs

accompanied by strict requirements for quality, schedule, and cost. ISO 9000 start up experience. International business experience in Europe as NATO Frigate Program Manager and Australia in support of FFG 7 Class Frigate construction.

PRESIDENT, RICHMOND CONSULTING GROUP, RICHMOND, VA.

Consultant to businesses for program management and manufacturing challenges involving complex systems. Established in 1996 specializing in the design, construction, and repair of commercial ships and Naval vessels. Significant experience with Navy ship construction and technical issues for steam and gas turbine propulsion ships. Certified as Navy Fleet Boiler Inspector. Expert witness experience regarding U.S. Navy and commercial ship design, construction and maintenance with special emphasis on marine steam propulsion systems. In particular, the specifications for and use of asbestos containing insulation materials aboard ship and present in shipyards for operations, shipbuilding, and maintenance applications. This includes victims with Mesothelioma due to use of asbestos for insulation, lagging, gaskets and packing aboard ships and in shipyards on boilers, turbines, main and auxiliary steam systems, as well as the equipment connected to the steam systems, i.e., pumps, valves and traps etc. Familiarity with ship and shipyard production and maintenance with emphasis on lean manufacturing, process improvement, cost reduction, and elimination of waste. Clients include General Dynamics Information Technology, U.S. Navy, Georgia Pacific, L-3

Corp, KPMG Inc., Eaton Corp., and Lockheed Martin. Expert witness experience supporting U.S. Department of Justice, Daimler-Chrysler, Honeywell Corp., U.S. Coast Guard, Siemens (Marine Power Gen. Div), Worthington/ Dresser Rand, Georgia Pacific, Crane Valve, Ford Motor Corp., Electrolux SA (Sweden), and numerous law firms nationwide.

VICE PRESIDENT/ DIVISION GENERAL MANAGER, TURBINE MANUFACTURING DIV. OF ABB (ASEA BROWN BOVERI) POWER GENERATION INC., RICHMOND, VA.

Responsible for all operational aspects of manufacturing with design and engineering support on site. Division consisted of 140 employees in 155K sq. ft. facility performing the manufacture and service of Steam and Gas Turbines and Generators (100+ megawatts) for the utility industry. Initiated root cause/corrective action process to evaluate rework rates. Nine (9) direct reports; assembled first US 206 megawatt GT-24 Gas Turbine in US. Established factory metrics–ISO 9002 certification achieved in 15 months, significant cost reductions made on all product lines. Revenues $20 million.

COMMANDING OFFICER, SUPSHIP PASCAGOULA AT INGALLS SHIPBUILDING DIVISION OF LITTON INDUSTRIES, PASCAGOULA, MISSISSIPPI

As Navy Captain and Supervisor of Shipbuilding Pascagoula (Ingalls - 17,000 workers), led staff of 500+

personnel administering contracts for construction and maintenance of Navy, Army and NOAA ships at ten shipyards. Delivered 63 ships in 4 years on the Gulf Coast in Mississippi, Alabama, and Florida. 1992 shipbuilding/repair budget $1.2 billion. On site accountability for technical decisions, contractual obligations, quality assurance, and legal/environmental aspects in a production setting. Source selection authority for major ship repair contracts. Ships under construction/overhaul: Aegis Cruisers (CG 47), Amphibious Assault Ships (LHD 1), Aegis Destroyers (DDG 51), and various Navy and Army vessels.

PROGRAM MANAGER, CG 47 AEGIS CLASS GUIDED MISSILE CRUISER, NAVAL SEA SYSTEMS COMMAND, PMS 400, WASHINGTON, D.C.

Navy Program Manager responsible for a program of twenty-seven Aegis gas turbine ships constructed at Ingalls Shipyard and Bath Iron Works. In 1987, $22 billion budget and third largest DOD program, with 5 ships purchased for $4.4 billion dollars. Managed staff of Engineers and Logistician Specialists to support both shipyards. Five Aegis Cruisers delivered on or ahead of schedule with $50 million underrun. Played major role in a $32 million claims settlement. Worked with shipbuilder directly to reduce both direct/indirect costs for both labor and material ship costs.

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PROGRAM MANAGER AND TECHNICAL DIRECTOR, FFG 7 CLASS GUIDED MISSILE FRIGATE, NAVSEA PMS 399, WASHINGTON, D.C.

Program Manager for 55 Ships (4 Australian) built at 3 shipyards, Bath Iron Works, Todd Los Angeles, and Todd Seattle. $9 billion budget, staff of 78. Eight gas turbine powered frigates delivered 50 weeks ahead of schedule with ship cost of $300+ million each. Responsible to Secretary of the Navy for all planning, budgeting, contracting and engineering, including Foreign Military Sales. NATO Frigate (NFR-90) Program Manager for US. As Technical Director, made significant improvements to the class. Participated in 45+ Builders & Acceptance Trials with U.S. Navy Board of Inspection and Survey.

PRODUCTION ENGINEER, NORFOLK NAVAL SHIPYARD, PORTSMOUTH, VA

Direct on site teamwork with waterfront Production Shops to improve Industrial Processes and Methods. Norfolk Naval Shipyard is a nuclear certified public shipyard with approximately 10,000 employees performing the repair and overhaul of nuclear/non-nuclear surface ships, submarines, and aircraft carriers. Project Officer for nuclear shore steaming barge design/construction. Led a team of 100 Industrial Engineers/Technicians and conducted numerous Industrial Engineering studies for shipyard foundry, machine shop, plating etc. Major capital improvements approx $15 million over 3 year period.

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SHIPYARD/SHIPBOARD EXPERIENCE

Repair (maintenance) Officer with 17 production shops and work force of 400 on large nuclear certified Destroyer Tender, USS Puget Sound (AD 38). Assigned to the Boston Naval Shipyard as Ship Superintendent for the overhaul of destroyers. Qualified as Certified Navy Fleet Boiler Inspector. Early ship steam propulsion experience included commissioning Chief Engineer for the USS Julius A. Furer (DEG-6) and Main Propulsion Assistant on USS Davis (DD 937). Qualified as Surface Warfare Officer and Fleet Officer of the Deck (OOD). Awarded Navy Achievement Medal by CINCPACFLT as Officer of the Deck on Davis when receiving hostile fire off the coast of Vietnam.

EDUCATION

United States Naval Academy, Annapolis, MD -- B.S. Naval Science (Engineering--With Distinction)
Massachusetts Institute of Technology, Cambridge, MA.
M.S. Mechanical Engineering (Propulsion Major)
O. E., Ocean Engineer[46] (Naval Architecture/ Marine Engineering)
University of Virginia, Darden School of Business, Charlottesville--The Executive Program

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46. The program for the Engineer Degree at MIT requires more advanced and broader competence in engineering and science subjects the Master's Degree; the Engineer Degree is not commonly awarded at U.S. colleges and universities with engineering programs.

Appendix E

National Defense University, Industrial College of the Armed Forces (ICAF), Washington, DC
(One year Executive Program-Govt. Contracting, Public Policy)
US Naval Destroyer Engineering School (SWOS), Newport, RI
US Navy Nuclear Ship Superintendent's Course, Puget Sound Naval Shipyard, Bremerton, WA
(Reactor Physics and Radiological Control for Submarine S5W Plant)

PROFESSIONAL ORGANIZATIONS

American Society of Naval Engineers (ASNE--Past Committee Chair, National Council)
Society of Naval Architects and Marine Engineers (SNAME)
National Society of Professional Engineers
Virginia Chamber of Commerce
Society of Manufacturing Engineers (SME--Past Chairman, Richmond Chapter)
Virginia Ship Repair Association (VSRA)
American Society of Mechanical Engineers (ASME)

PUBLICATIONS AUTHORED

- Gas Turbine Power Plant Design for Fast Combatant Support Ship, *Society of Naval Architects and Marine Engineers. (SNAME) Journal, 1972 (Received award for student paper of the year)*

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- Method Improvements-Cornerstone for Future Shipyard Productivity Gains, *Naval Engineers Journal, 1977*

- Production Engineering In a Naval Shipyard, *Naval Engineers Journal, 1979*

- The Guided Missile Frigate Design--Impact by the Board of Inspection Trials, *Naval Engineers Journal, 1982*

- The Management of Surface Ship Maintenance, *Naval Engineers Journal, 1990*

ATTACHMENT (2) R. BRUCE WOODRUFF --
EXPERT WITNESS CASES DEPOSED

DATE	CASE TESTIFIED *REPRESENTED	LAW FIRM & ATTORNEY	COURT/ LOC.	DECISION
APRIL 26 02	POWERS v. WORTHINGTON PUMP DRESSER RAND*	GOLLATZ GRIFFIN AND EWING. CHUCK HOWARD	RICH. VA	SETTLED
MAY 8 02 TRIAL	POWERS v. WORTHINGTON PUMP DRESSER RAND*	GOLLATZ GRIFFIN AND EWING. CHUCK HOWARD	NEW YORK NY **TRIAL**	SETTLED
JULY 17 02	MACDONALD v. WORTHINGTON PUMP DRESSER RAND*	GOLLATZ GRIFFIN AND EWING. CHUCK HOWARD	LOS ANG. CA	SETTLED
JUNE 30 03	LAVALEE v. HONEYWELL/BENDIX*	PERKINS COIE DAVID BINDER	ALEX. VA	SETTLED

AUG 13 03	VELASQUEZ v. BORG-WARNER, FORD, DAIMLER CHRYSLER & GEN MOTORS*	THELAN REID & PRIEST; GORDON & REIS	ALEX. VA	SETTLED
OCT 03 03	BRAINERD v. BORG-WARNER, FORD, DAIMLER CHRYSLER & GEN MOTORS*	THELAN REID & PRIEST. JIM OSTERTAG	ALEX. VA	SETTLED
APR 23 04	BRAATEN v. GOULD CORP.*	NAMAN HOWELL. NEAL PIRKLE	RICH. VA	SETTLED
JAN 18 05	WALRAVEN V. AMERICAN STANDARD FORD & GEN MOTORS*	KIRKPATRICK, LOCKHART ET AL. CHRIS TEMPLE	ALEX. VA	SETTLED
MAR 10 05	VAUGHN v. CRANE CO*	KIRKPATRICK, LOCKHART ET AL. CHRIS TEMPLE	WASH. DC	SETTLED

AUG 10 05	GENDREAU v. HONEYWELL, CHRYSLER & GEN MOTORS*	THELEN REID & PRIEST. ROSS PETTY	S. FRAN. CA	SETTLED
JULY 13 06	BAXTER* v. ALFA LAVAL INC.	COADY LAW FIRM-DAVID FINACKUS; CHRIS DUFFY	WASH. DC	SETTLED
AUG 1 06	SERIO* v. AC and S, inc, ET AL	ASHCRAFT & GEREL DAVID LAYTON	BALT. MD	SETTLED
JUNE 15 07	CAMPBELL* v. AC and S, inc, ET AL VOL I	EARLY, LUDWICK & SWEENEY, LLC. RICH BULLOCK	RICH. VA	SETTLED
AUG 17 07	CAMPBELL* v. AC and S, inc, ET AL VOL II	EARLY, LUDWICK & SWEENEY, LLC. RICH BULLOCK	N. HAVEN CT	SETTLED

JULY 18 08	OWENS V. A CHALMERS ET AL, HONEYWELL* & G. PACIFIC*	PERKINS COIE (LA) BRIAN SOFFER, D. BIDERMAN	RICH. VA	SETTLED
SEPT 12 08	VAN KIRK V. BORG-WARNER ET AL, HONEYWELL/BENDIX*	PERKINS COIE (LA) VICK MANSOURIAN	RICH. VA	SETTLED
SEPT 15 08	ORNSTEIN V. ALFA LAVAL ET AL, HONEYWELL/BENDIX*	PERKINS COIE (LA) VICK MANSOURIAN, D. BIDERMAN	RICH. VA	SETTLED
JUNE 16 09	NIEBAUER V. 3M CO HONEYWELL/BENDIX*	PERKINS COIE LOS ANGELES SC D. BIDERMAN/ D. FRIEDMAN	RICH. VA	SETTLED
JUNE 22 09	GOEBEL V. BONDEX CORP. GA PACIFIC* & HONEYWELL*	PERKINS COIE LOS ANGELES SC D. BIDERMAN	RICH. VA	SETTLED

OCT 2 09	PANTALONE* V. A.W. CHESTERTON, ET AL	EARLY, LUDWICK & SWEENEY, LLC. CHRIS MEISENKOTHEN	N. HAVEN CT	SETTLED
OCT 29 09	RAYNOR V. ALFA LAVAL ET AL HONEYWELL* & BONDEX*	DAVIES, MCFARLAND & CARROLL JULIE FRIEDMAN	RICH. VA	SETTLED
JAN 12 10	RIEMANN* V. AALBORG INDUSTRIES ET AL BUFFALO PUMPS	EARLY, LUDWICK & SWEENEY, LLC. DONNI YOUNG	N. HAVEN CT	SETTLED
MAR 11 10	MILLER V. BORG WARNER MORSE, HONEYWELL* ET AL	PERKINS COIE LOS ANGELES SC D. BIDERMAN	RICH. VA	SETTLED

MAR 25 10	KEENER* V. A.W. CHESTERTON, ET AL BUFFALO PUMPS	EARLY, LUDWICK & SWEENEY, LLC. CHRIS MEISENKOTHEN	NORFLK VA	OPEN
SEPT 22 10	BARAGAR V. ASBESTOS DEFENDANTS, HONEYWELL* ET AL	PERKINS COIE, SAN FRANCISCO SC D. BIDERMAN	WASH. DC	SETTLED
FEB 10 11	KEENER* V. BUFFALO PUMPS, ET AL (2ND TESTIMONY)	EARLY, LUDWICK & SWEENEY, LLC. B. KENNEY	RICH. VA	OPEN
JUNE 6 12	OUELLETTE* V. A.W. CHESTERON ET AL	EARLY, LUC., SWEEN. & MEISENKOTHEN LLC. E. MURRAY	RICH. VA	OPEN

JULY 10 12	GIRTMAN* V. ACE HARDWARE ET AL	EARLY, LUC., SWEEN. & MEISENKOTHEN LLC. E. MURRAY	RICH. VA	OPEN
JULY 11 12	THOMAS* V. AIR & FLUIDS SYS. CORP ET AL	EARLY, LUC., SWEEN. & MEISENKOTHEN LLC. E. TAVELLI	RICH. VA	SETTLED
AUG 22 12	CANNON* V. CBS CORP. ET AL	EARLY, LUC., SWEEN. & MEISENKOTHEN LLC. B. KENNEY	N. HAVEN CT	OPEN
SEPT 19 12	OUELLETTE* V AW CHESTERTON. ET AL (2ND TESTIMONY)	EARLY, LUC., SWEEN. & MEISENKOTHEN LLC E. TAVELLI	RICH. VA	OPEN
OCT 16 12	CANNON* V. CBS CORP. ET AL (2ND TESTIMONY)	EARLY, LUC., SWEEN. & MEISENKOTHEN LLC. B. KENNEY	RICH. VA	OPEN

NOV 27 12	KEENER* V. BUFFALO PUMPS, ET AL (3RD TESTIMONY)	EARLY, LUCARELLI, SWEENEY. & MEISENKOTHEN, LLC. CHRIS MEISENKOTHEN	RICH. VA	OPEN
JAN 9 13	KEENER* V. BUFFALO PUMPS, ET AL (4TH TESTIMONY)	EARLY, LUCARELLI, SWEENEY. & MEISENKOTHEN, LLC. CHRIS MEISENKOTHEN	RICH. VA	OPEN

Appendix E

/s/
R. Bruce Woodruff
Captain, US Navy (Ret)

APPENDIX F — *DeVries, et ux. v. General Electric Co., et al.*, No. 13-cv-474 (E.D. Pa.) (Doc. 296, Pages 17, 18, 19, 22-24) (Response to Motion for Summary Judgment of CBS Corp.) (Plaintiff's Discovery Deposition, Pages 72-73, 82, 385, 399-402, 406-408)

* * *

[72]Q. Any other types of equipment that you recall on which maintenance or repair work was performed other than the boilers, the turbines, the pumps, generators, switchboards and diesel generators?

A. Well, there are other auxiliaries also, but --

Q. What do you mean by other auxiliaries?

A. I believe we mentioned that the primary power source -- power generators, electric generators were steam driven. When I say auxiliaries, I'm thinking of things like condensate pumps, pumps that would cover a multitude of sins.

Q. Any other types of equipment that you recall maintenance or repair work being performed on?

A. I don't recall any at the moment.

Q. Do you recall any types of equipment on which maintenance or repair work was performed in the fire rooms?

[73]A. Yes.

Q. And what types of equipment do you recall in the fire rooms?

A. Pumps, there was blowers.

Q. Any other types of equipment?

A. Steam traps. Again, I don't recall sitting here.

Q. Let me ask you this. The USS TURNER, you mentioned that that was a steam driven ship; correct?

A. Correct.

Q. So there would have been steam lines running throughout the ship; is that correct?

A. The steam lines for power were limited to the boiler room serving an engine room. So that meant two pairs.

Q. Would there also be pipe lines running throughout the ship taking the heat and hot water throughout the ship?

A. There would be hot water service, fresh water service.

* * *

[82]BY MR. STOKES:

Q. Do you know if any repair or maintenance work was performed on the electrical generators in your vicinity?

A. Yes.

Q. And what type of work was performed on the electrical generators?

A. The steam -- the steam ends had to be repacked. The electrical ends had to have parts replaced.

Q. Where was the repacking work performed on the generator?

A. It was either on the ship or in a Navy Yard it might have been removed.

Q. Where specifically, though, on the generator does the repacking work take place?

A. Wherever there's a possibility of a leak, I guess.

* * *

[385]Q. Do you recall whether there were packing materials on the General Electric main propulsion turbines?

MR. KATTNER: Objection to form.

THE WITNESS: Certainly there were bearings that were involved, but not packing as you think of packing on a valve stem or a pump.

BY MR. REICH:

Q. Okay. Were there seals on the main propulsion turbines manufactured by General Electric?

A. Well, again, there are seals in the assembly of the turbine.

Q. Okay. And was it necessary for you and your crew at any point to disturb, replace, repair any of those seals?

A. I don't recollect ever replacing or repairing a seal.

Q. Okay. Was it your testimony that the main propulsion turbines from General Electric had to be insulated or needed insulation --

A. They were --

* * *

[399]Q. All right. Let me put it this way. You weren't involved in the Navy's consult -- specifications as to the safety precautions that it issued, were you?

A. I was not involved in the Navy specifications.

[400]Q. But you carried out as the engineering officer or the lower officer ranks you had on the TURNER in accordance with what you were taught by the Navy at the destroyer school in conjunction with the other material you consulted; is that correct?

A. The other materials such as manufacturer's instructions passed through by the Navy.

Q. And the people beneath you worked in accordance with your orders as the officer in charge of engineering --

A. Right.

Q. -- whether the overall engineering officer or the lower ranks?

A. Yes.

Q. With regard to the SSTGs, the ship service turbine generators --

A. Okay.

Q. -- I think you made it quite clear that the electrical part, the generator part, to your knowledge, did not have any asbestos that you were aware of associated with it; is that correct?

[401]A. I'm only aware that insulating materials in all electrical equipment were in that period of time most often, maybe all often phenolic resins which were reinforced with asbestos.

MR. STOKES: Move to strike, speculation.

MR. KATTNER: Move to strike, speculation.

BY MR. KATTNER:

Q. But to the extent that you don't personally know one way or the other whether any of the specific GE or GE equipment you just testified about, electrical equipment did or did not have asbestos in it on the USS TURNER, do you?

A. I cannot from personal knowledge know it.

Q. And with respect to work on the internal parts of any of those pieces of electrical equipment, whether they were motors or generators, is it safe to say that you personally were not involved in that? Well, let me put it this way.

[402]Let me rephrase the question. You personally were not there when the motors were opened up and disassembled, were you?

A. I was there when motors were opened up if they were opened up.

Q. If they were opened up. Do you attribute, do you know if it was GE, Westinghouse or some other manufacturer's motors?

A. I do not know the source of the motor --

Q. And as to --

A. -- other than most of the electric motors on the TURNER were from one of the two.

Q. Got you.

A. They were from other sources, too.

Q. And with respect to whether there was any particular asbestos-containing part exposed by opening up the motors could you tell one way or another? Let me put

it this way. When the motors were opened up was there anything you identified as this so-called phenolic that was exposed to the air?

A. Yes.

* * *

[403]Q. Okay. Was there any dust from that particular phenolic part when these motors were opened up that you recall?

A. I remember dust.

Q. But whether it came from the phenolic or some other source do you know?

A. I cannot be certain.

Q. Okay. And the operations that you observed with respect to the opening up of the motors did they generate dust from that phenolic specifically?

A. The physical opening did not generate dust. It may have allowed dust that was inside the motor to escape.

Q. But as to the source of that dust from the phenolic or some other place you don't know?

A. No.

Q. Now, as to the insulation on the outside of the ship service turbine generator or these various drive turbines for the different pumps that you were just describing was that insulation this same type of external insulation that was elsewhere on the TURNER

* * *

[407]Q. Did you supervise work performed on a DeLaval pump?

A. Yes.

Q. And did you personally perform hands-on work on a DeLaval pump?

A. Maybe occasionally.

Q. Over the three years of work on the USS TURNER, how many times would you say you performed hands-on work on a DeLaval pump?

A. Only a handful. And that would be to demonstrate to a seaman how to do something.

Q. And your work involving DeLaval pumps was only aboard the USS TURNER; is that correct?

A. Yes.

Q. How did you know that a pump was manufactured by DeLaval?

A. You had many -- DeLaval had many pumps on the TURNER. Several had nameplates, several had manuals, operating instructions from DeLaval. We had to know who the pump producer was of course.

Q. How many DeLaval pumps were on the ship?

A. Many pumps. I can't recollect how many.

[408]Perhaps several dozen. DeLaval was the major supplier of pumps for this class of destroyer.

Q. Where were they located on the ship?

A. I remember condensate pumps, auxiliary condensate pumps, feed pumps I believe, I believe even some oil booster pump. There were a wide array of applications and uses.

Q. They were in the engineering spaces; is that correct?

A. I'm referring to those that were in the engineering spaces.

Q. Can you be more specific than that?

A. Well, the engineering spaces would be the engine rooms, fire rooms.

Q. So both of those types --

A. Yes.

Q. -- of rooms?

A. Yes. Yes. Yes.

Q. Of the several dozen that you recall, how many of those did you personally work on?

A. Of the several dozen, I was present for supervising and sometimes showing how to do the work on those pumps.

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APPENDIX G — *DeVries, et ux. v. General Electric Co., et al.*, No. 13-cv-474 (E.D. Pa.) (Doc. 298, Pages 21-22, 23) (Response to Motion for Summary Judgment of Buffalo Pumps, Inc.) (Plaintiff's Discovery Deposition, Pages 198-205, 238-241)

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[198]BY MS. SCHWEIZER:

Q. Sir, my question was -- I know we're talking about some years ago and things like that, but let's start with the basics. I know Mr. Stokes answered -- asked this question, but I didn't get your answer and I don't know if it was answered or not. The number of pumps, how many pumps do you believe were located in either engine room on the TURNER?

[199]A. I don't know.

Q. Are we talking about hundreds? Are we talking about -- can you approximate at all or estimate for me at all?

A. It's pretty hard to estimate, but, again, you have the data.

Q. Sure. But as you sit here you couldn't give me any fair estimate?

A. I can't estimate.

Q. Okay. Could you estimate at all for the fire room? I'm picking up probably not, but --

A. Probably not.

Q. Okay. And I understand that you remember being around packing of pumps in general on the TURNER. But my question was specifically for Warren. As you sit here today, sir, can you indicate or can you testify that you were around when a Warren pump was repacked?

A. Yes. With the understanding that I was around for so many different pump repackings that there had to be Warren pumps as well as DeLaval and Buffalo.

[200]Q. And you're just basing that because you -- they were there on the ship; is that correct?

A. They were -- they were repacked and repacked and repacked.

Q. Okay.

A. And never was it an easy job, partly because of not having the right tools.

Q. You indicated about the differences of pumps and where possibly the location of this packing would be placed; correct?

A. Yes.

Q. Could you give me any indication on the Warren pumps where the packing would have to be replaced at all?

A. Well, anywhere around the shaft.

Q. Okay. Do you know the location of the shaft associated with the Warren pump?

A. Not specifically Warren, but any pump has something that causes the shaft to turn and the pump end turns with the shaft, so --

Q. But you can't tell me what the Warren pump looked like in that --

A. I can't -- I can't describe a Warren [201]pump, and for that matter there were so many different variations.

Q. That's what I was trying -- so you couldn't -- again, we're talking -- I think we're getting each other, but crossing each other's words here. You can't give me any physical description of how the shaft was on a Warren pump located on the TURNER; correct?

A. Yes.

Q. That's correct? Yes. Okay. You talked a little bit about insulation associated with pumps on the TURNER. When you were talking about insulation with pumps, are you talking about the pipes leading in and out of the pump or on the pump itself?

A. On the pump itself.

Q. Okay. As you sit here today, sir, do you have any recollection or memory of a Warren pump actually being insulated on the pump itself?

A. I have a recollection, but I can't say which pump.

Q. So there were -- it's true, sir, that some pumps on the -- some pumps on the TURNER [202]were not insulated; correct?

A. A fresh water circulating pump is not insulated.

Q. Absolutely. Okay.

A. A condensate pump is insulated.

Q. So you answered my question and gave me a little bit more detail. That's great. But there are some pumps that were insulated and other pumps that were not; correct?

A. That's right. Yes.

Q. Okay. Do you know how many condensate pumps were located on the TURNER?

A. I don't remember. Again, you have the data.

Q. Because some pumps were not insulated and some pumps were insulated, it would be correct, sir, that you could not tell me if a Warren pump was insulated while you were on board the TURNER; correct?

A. Warren had so many pumps some had to be insulated.

Q. And you're just basing that on the number of the pump?

A. Number of pumps. And, again, you can go [203]to the data and see which pumps and that will tell you which ones were insulated.

Q. As far as the third area that you talked with with Mr. Stokes was some -- when you were around when others would clean the flanges when they would remove a pump; correct?

A. Scrape and brush.

Q. Okay. Not all the pumps were ever removed from the TURNER; correct?

A. I don't know.

Q. Okay. Do you remember as you sit here today, sir, if you were ever around when a Warren pump was actually removed?

A. I don't know.

Q. In the engine spaces, sir, I understand there's several different types of pumps. Are there certain types of pumps that are used more than others?

A. A pump is specified for a purpose, its output and pressure and whatever else.

Q. Are they all constantly working on board?

A. They're not all in constant use.

Q. Okay. Are there a certain amount of -- [204]strike that. When you were on the TURNER and you were working in these engine spaces, did you ever note like a number of operating hours for a pump before it would have to go under or go under any repair or maintenance, that they would be -- the pump would be fine for a certain amount of hours or sea hours before it would have to have any repair or maintenance?

A. Manuals would tell you how many hours before maintenance was -- how many hours the pump should run before maintenance.

Q. Okay. The manuals that you have just referred to, are these Navy manuals?

A. Supplied by the Navy, but mostly from the manufacturer.

Q. Okay. When you say they were supplied by the Navy but from the manufacturer, how do you know they came from the manufacturer?

A. Name.

Q. Okay. Did you ever see any Warren manuals?

A. I recollect I did.

Q. Okay. And what do you recollect? What do you remember that you saw?

[205]A. In the bookshelf in my stateroom there were a line of manuals.

Q. Did they all look the same?

A. No. Different color, different things.

Q. Okay. Okay. Do you remember the color or anything to the Warren --

A. No.

Q. -- manual?

A. No.

Q. Or a Warren book?

A. No.

Q. Okay. Do you remember any of the interior contents to a Warren book?

A. I, no.

Q. Okay. Do you remember as you sit here today the number of operating hours --

A. No.

Q. -- that a Warren pump could go before having to do any maintenance or repair?

A. No. But also a different pump would have different operating hours.

* * *

[238]Q. And would the same materials be used for the maintenance and repair of these pumps?

A. Yes, assuming similar application.

MR. WEINBERG: Objection.

BY MR. REICH:

Q. And also assuming the size requirements for each individual pump; is that correct?

A. Correct.

MR. WEINBERG: Objection.

BY MR. REICH:

Q. Do you believe you were exposed to any asbestos when you were supervising the work on Buffalo pumps?

MR. WEINBERG: Objection.

THE WITNESS: Yes.

BY MR. REICH:

Q. And why is that?

MR. WEINBERG: Objection.

THE WITNESS: Same as with other pumps, if it was insulated, the insulation had to be removed. Packing had to be removed. Flanges had to be -- gaskets had [239]to be replaced. Whether it was on a flange where you were scraping and wire brushing or as we've said too many times trying to pull packing out of a stuffing box or removing the insulation, the story is the same.

BY MR. REICH:

Q. And how frequently would that have to be done on pumps on the TURNER?

MS. SCHWEIZER: Objection, form.

THE WITNESS: We had pumps that we had to repack it seemed like weekly. I mean, the question came up just before I don't -- I don't have a recollection of whose pump was repacked when. But we were constantly, constantly repacking. And I know it's not just because I stood at that pump or that workbench, but also because we ran out of packing materials. And we'd beg and borrow from other destroyers.

[240]Q. Did you see any warning labels on any of the Buffalo pumps with regard to exposure to asbestos?

A. I saw no warning labels.

EXAMINATION

BY MR. WEINBERG:

Q. Very quickly, sir, as far as the pumps being insulated, that insulation you talked about that's not a formed insulation. It's more of a powdery mix. And it's made in a trowel area or bucket or something and then they apply it to the pump, the outside of the pump. Is that what you are talking about?

A. Sometimes there were blanket type such as would be used over the main turbines. It depended on the pump, depended on the pump supplier, depended on the pump supplier's specs.

Q. Okay. As far as the blankets, do you [241]know who manufactured those blankets?

A. No.

Q. All right. And as far as the powdery mix that I talked about that you would trowel onto the pumps, do you know who manufactured that?

A. Unfortunately we did it ourselves. So we exposed ourselves to --

Q. Yeah. I know you guys did that. But that was a product that came in a bag from -- do you know who manufactured that?

A. No.

* * * *